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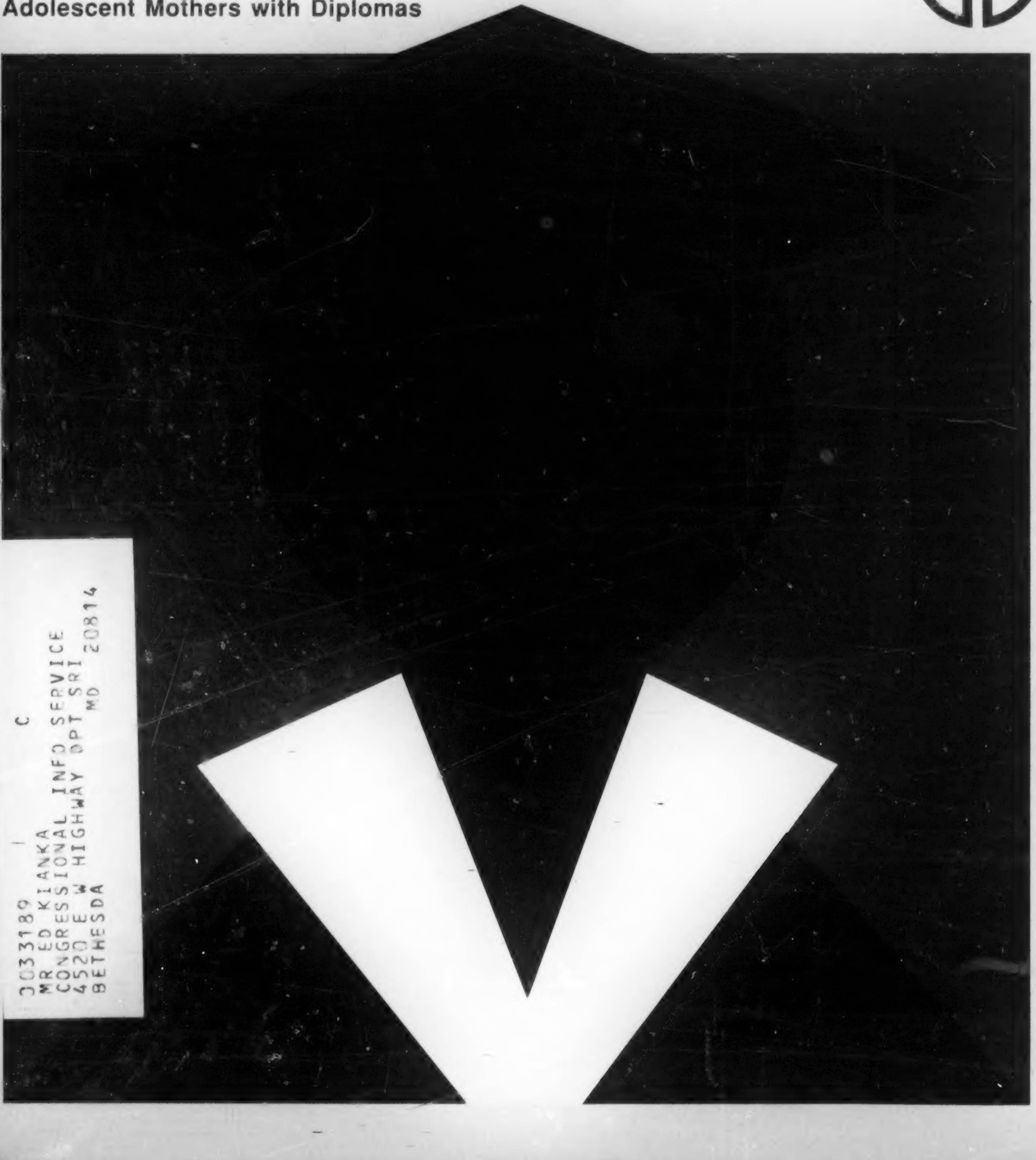
Family Planning
Perspectives

Volume 21, Number 5, September/October 1989

Lessons from Abortion Referenda
Sex Among Teenagers in Foster Care

Adolescent Mothers with Diplomas



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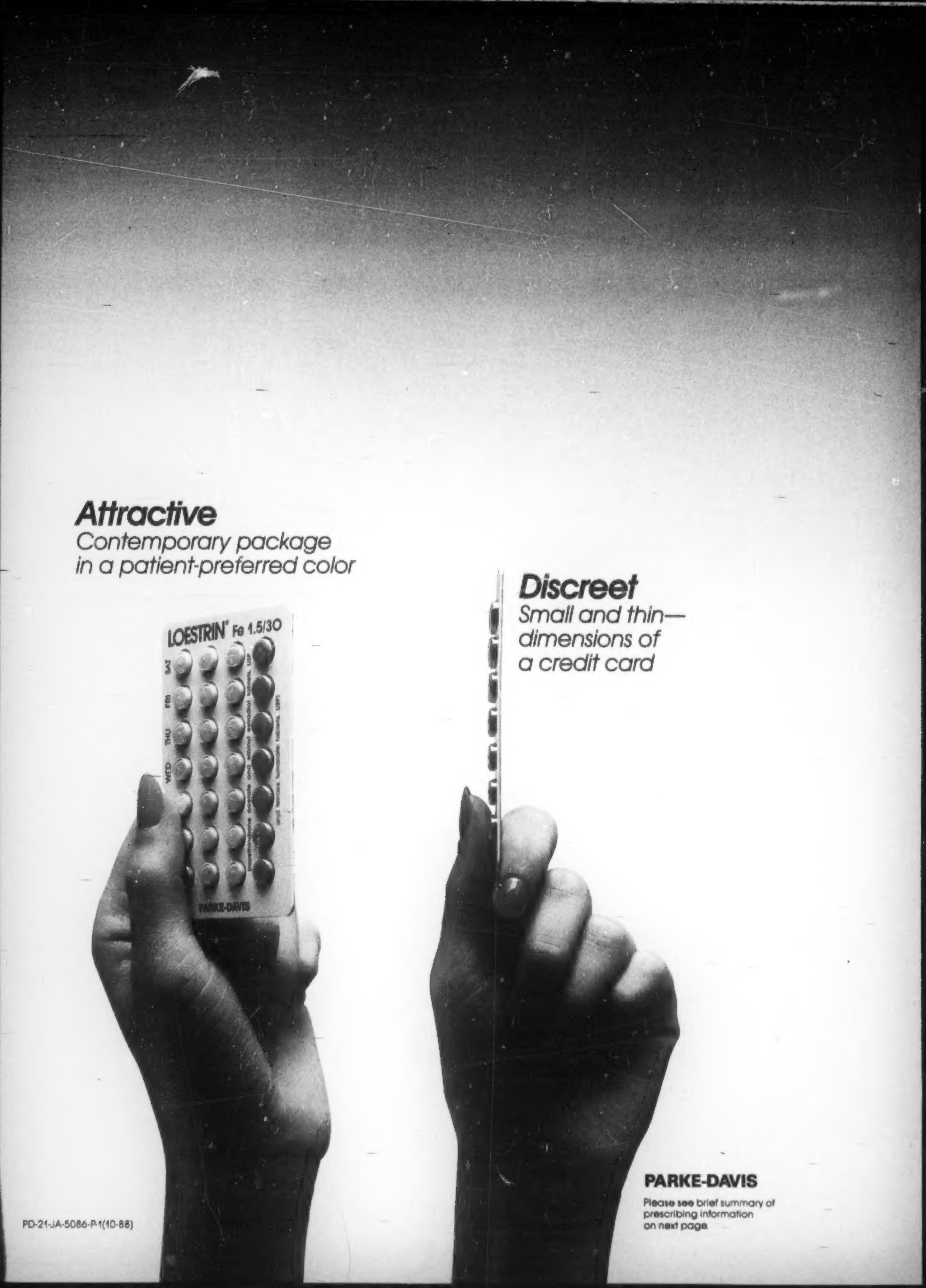
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INDICATIONS AND USAGE: Loestrin 21 and Loestrin Fe are indicated for the prevention of pregnancy in women who elect to use oral contraceptives (OCs) as a method of contraception. **Dose-Related Risk of Thromboembolism from Oral Contraceptives:** Two studies have shown a positive association between the dose of estrogens in oral contraceptives and the risk of thromboembolism. For this reason, it is prudent and in keeping with good principles of therapeutics to minimize exposure to estrogen. The OC product prescribed for any given patient should be that product which contains the least amount of estrogen that is compatible with an acceptable pregnancy rate and patient acceptance. It is recommended that new acceptors of OCs be started on preparations containing 0.05 mg or less of estrogen. **CONTRAINDICATIONS:** OCs should not be used in women with any of the following conditions: 1. Thrombophlebitis or thromboembolic disorders; 2. A past history of deep vein thrombophlebitis or thromboembolic disorders; 3. Cerebral vascular or coronary artery disease; 4. Known or suspected carcinoma of the breast; 5. Known or suspected estrogen-dependent neoplasia; 6. Undiagnosed abnormal genital bleeding; 7. Known or suspected pregnancy (see Warning No. 5); 8. Benign or malignant liver tumor which developed during the use of oral contraceptives or other estrogen-containing products.

WARNINGS

Cigarette smoking increases the risk of serious cardiovascular side effects from oral contraceptive use. This risk increases with age and with heavy smoking (15 or more cigarettes per day) and is quite marked in women over 35 years of age. Women who use oral contraceptives should be strongly advised not to smoke.

The use of oral contraceptives is associated with increased risk of several serious conditions including thromboembolism, stroke, myocardial infarction, hepatic adenoma, gallbladder disease, and hypertension. Practitioners prescribing oral contraceptives should be familiar with the following information relating to these risks.

1. *Thromboembolic Disorders and Other Vascular Problems:* An increased risk of thromboembolic and thrombotic disease associated with the use of OCs is well established. Three principal studies in Great Britain and three in the United States have demonstrated an increased risk of fatal and nonfatal venous thromboembolism and stroke, both hemorrhagic and thrombotic. These studies estimate that users of OCs are 4 to 11 times more likely than nonusers to develop these diseases without evident cause. **Cerebrovascular Disorders:** In a collaborative American study of cerebrovascular disorders in women with and without predisposing causes, it was estimated that the risk of hemorrhagic stroke was 2.0 times greater in users than in nonusers and the risk of thrombotic stroke was 4 to 9.5 times greater in users than in nonusers. **Myocardial Infarction:** An increased risk of myocardial infarction associated with the use of OCs has been reported, confirming a previously suspected association. These studies, conducted in the United Kingdom, found, as expected, that the greater the number of underlying risk factors for coronary artery disease (cigarette smoking, hypertension, hypercholesterolemia, obesity, diabetes, history of preeclamptic toxemia), the higher the risk of developing myocardial infarction, regardless of whether the patient was an OC user or not. OCs, however, were found to be a clear additional risk factor. In terms of relative risk, it has been estimated that OC users who do not smoke (smoking is considered a major predisposing condition to myocardial infarction) are about twice as likely to have a fatal myocardial infarction as nonusers who do not smoke. OC users who are also smokers have about a 5-fold increased risk of fatal infarction compared to users who do not smoke, but about a 10- to 12-fold increased risk compared to nonusers who do not smoke. Furthermore, the amount of smoking is also an important factor. In determining the importance of these relative risks, however, the baseline rates for various age groups must be given serious consideration. The importance of other predisposing conditions mentioned above in determining relative and absolute risks has not as yet been quantified; it is quite likely that the same synergistic action exists, but perhaps to a lesser extent. **Risk of Dose:** In an analysis of data derived from several national adverse reaction reporting systems, British investigators concluded that the risk of thromboembolism, including coronary thrombosis, is directly related to the dose of estrogen used in oral contraceptives. Preparations containing 100 mcg or more of estrogen were associated with a higher risk of thromboembolism than those containing 50 to 80 mcg of estrogen. Their analysis did suggest, however, that the quantity of estrogen may not be the sole factor involved. This finding has been confirmed in the United States. Careful epidemiological studies to determine the degree of thromboembolic risk associated with progestogen-only OCs have not been performed. Cases of thromboembolic disease have been reported in women using these products, and they should not be presumed to be free of excess risk. **Persistence of Risk:** In confirmation of earlier reports, two studies have suggested that an increased risk may persist for as long as 6 years after discontinuation of oral contraceptive use for cerebrovascular disease and 9 years for myocardial infarction. In addition, a prospective study suggested the persistence of risk for subarachnoid hemorrhage. **Estimate of Excess Mortality from Circulatory Diseases:** A large prospective study carried out in the U.K. estimated the mortality rate per 100,000 women per year from diseases of the circulatory system for users and nonusers of OCs according to age, smoking habits, and duration of use. The overall excess death rate annually from circulatory diseases for OC users was estimated to be 20 per 100,000 (ages 15 to 34 – 5/100,000; ages 35 to 44 – 33/100,000; ages 45 to 49 – 140/100,000), the risk being concentrated in older women, in those with a long duration of use, and in cigarette smokers. It was not possible, however, to examine the interrelationships of age, smoking, and duration of use, nor to compare the effects of continuous versus intermittent use. Although the study showed a 10-fold increase in death due to circulatory diseases in users for 5 or more years, all of these deaths occurred in women 35 or older. Until larger numbers of women under 35 with continuous use for 5 or more years are available, it is not possible to assess the magnitude of the relative risk for this younger age group. The available data from a variety of sources have been analyzed to estimate the risk of death associated with various methods of contraception. The estimates of risk of death for each method include the combined risk of the contraceptive method (eg, thromboembolic and thrombotic disease in the case of oral contraceptives) plus the risk attributable to pregnancy or abortion in the event of method failure. This latter risk varies with the effectiveness of the contraceptive method. The study concluded that the mortality associated with all methods of birth control is low and below that associated with childbirth, with the exception of OCs in women over 40 who smoke. (The rates given for pill only/smokers for each age group are for smokers as a class. For "heavy" smokers [more than 15 cigarettes a day] the rates given would be about double, for "light" smokers [less than 15 cigarettes a day], about 50 percent.) The lowest mortality is associated with the condom or diaphragm backed up by early abortion. The risk of thromboembolic and thrombotic disease associated with OCs increases with age after approximately age 30 and, for myocardial infarction, is further increased by hypertension, hypercholesterolemia, obesity, diabetes, or history of preeclamptic toxemia and especially by cigarette smoking. The physician and the patient should be alert to the earliest manifestations of thromboembolic and thrombotic disorders (eg, thrombophlebitis, pulmonary embolism, cerebrovascular insufficiency, coronary occlusion, retinal thrombosis, and mesenteric thrombosis). Should any of these occur or be suspected, the drug should be discontinued immediately. A four- to six-fold increased risk of postsurgery thromboembolic complications has been reported in OC users. If feasible, OCs should be discontinued at least 4 weeks before surgery of a type associated with an increased risk of thromboembolism or prolonged immobilization. 2. *Ocular Lesions:* There have been reports of neuro-ocular lesions, such as optic neuritis or retinal thrombosis, associated with the use of OCs. Discontinue OC medication if there is unexplained, sudden or gradual, partial or complete loss of vision; onset of proptosis or diplopia; papilledema; or retinal vascular lesions, and institute appropriate diagnostic and therapeutic measures. 3. *Carcinoma:* Long-term continuous administration of either natural or synthetic estrogen in certain animal species increases the frequency of carcinoma of the breast, cervix, vagina, and liver. Certain synthetic progestogens, none currently contained in OCs, have been noted to increase the incidence of mammary nodules, benign and malignant, in dogs. In humans, three case control studies have reported an increased risk of endometrial carcinoma associated with the prolonged use of exogenous estrogen in postmenopausal women. One publication reported on the first 21 cases submitted by physicians to a registry of cases of adenocarcinoma of the endometrium in women under 40 on OCs. Of the cases found in women without predisposing risk factors for adenocarcinoma of the endometrium (eg, irregular bleeding at the time OCs were first given, polycystic ovaries), nearly all occurred in women who had used a sequential OC. These products are no longer marketed. No evidence has been reported suggesting an increased risk of endometrial cancer in users of conventional-combination or progestogen-only OCs. Several studies have found no increase in breast cancer in women taking OCs or estrogens. One study, however, while also noting no overall increased risk of breast cancer in women treated with OCs, found an excess risk in the subgroups of OC users with documented benign breast disease. A reduced occurrence of benign breast tumors in users of OCs has been well-documented. In summary, there is at present no confirmed evidence from human studies of an increased risk of cancer associated with OCs. Close clinical surveillance of all women taking OCs is, nevertheless, essential. In all cases of undiagnosed persistent or recurrent abnormal vaginal bleeding, appropriate diagnostic measures should be taken to rule out malignancy. Women with a strong family history of breast cancer or who have breast nodules, fibrocystic disease, or abnormal mammograms should be monitored with particular care if they elect to use OCs instead of other methods of contraception. 4. *Hepatic Tumors:* Benign hepatic adenomas have been found to be associated with the use of OCs. One study showed that OC formulations with high hormonal potency were associated with a higher risk than lower potency formulations. Although benign, hepatic adenomas may rupture and may cause death through intra-abdominal hemorrhage. This has been reported in short-term as well as long-term users of OCs. Two studies relate risk with duration of use of the contraceptive, the risk being much greater after 4 or more years of OC use. While hepatic adenoma is a rare lesion, it should be considered in women presenting abdominal pain and tenderness, abdominal mass or shock. A few cases of hepatocellular carcinoma have been reported in women taking oral contraceptives. The relationship of these drugs to this type of malignancy is not known at this time. 5. *Use in or Immediately Preceding Pregnancy, Birth Defects in Offspring, and Malignancy in Female Offspring:* The use of female sex hormones – both estrogenic and progestational agents – during early pregnancy may seriously damage the offspring. It has been shown that females exposed *in utero* to diethylstilbestrol, a nonsteroidal estrogen, have an increased risk of developing in later life a form of vaginal or cervical cancer that is ordinarily extremely rare. This risk has been estimated to be of the order of 1 in 1,000 exposures or less. Although there is no evidence at the present time that OCs further enhance the risk of developing this type of malignancy, such patients should be monitored with particular care if they elect to use OCs instead of other methods of contraception. Furthermore, a high percentage of such exposed women (from 30% to 90%) have been found to have epithelial changes of the vagina and cervix. Although these changes are histologically benign, it is not known whether this condition is a precursor of vaginal malignancy. Male children so exposed may develop abnormalities of the urogenital tract. Although similar data are not available with the use of other estrogens, it cannot be presumed that they would not induce similar changes. An increased risk of congenital anomalies, including heart defects and limb defects, has been reported with the use of sex hormones, including OCs, in pregnancy. One case control study has estimated a 4.7-fold increase in risk of limb-reduction defects in infants exposed *in utero* to sex hormones (OCs, hormonal withdrawal tests for pregnancy or attempted treatment for threatened abortion). Some of these exposures were very short and involved only a few days of treatment. The data suggest that the risk of limb-reduction defects in exposed fetuses is somewhat less than 1 in 1,000 live births. In the past, female sex hormones have been used during pregnancy in an attempt to treat threatened or habitual abortion. There is considerable evidence that estrogens are ineffective for these indications, and there is no evidence from well-controlled studies that progestogens are effective for these uses. There is some evidence that triploidy and possibly other types of polyploidy are increased among abortuses from women who become pregnant soon after ceasing OCs. Embryos with these anomalies are virtually always aborted spontaneously. Whether there is an overall increase in spontaneous abortion of pregnancies conceived soon after stopping OCs is unknown. It is recommended that for any patient who has missed two consecutive periods, pregnancy should be ruled out before continuing the contraceptive regimen. If the patient has not adhered to the prescribed schedule, the possibility of pregnancy should be considered at the time of the first missed period, and further use of OCs should be withheld until pregnancy has been ruled out. If pregnancy is confirmed, the patient should be apprised of the potential risks to the fetus and the advisability of continuation of the pregnancy should be discussed in the light of these risks. It is also recommended that women who discontinue oral contraceptives with the intent of becoming pregnant use an alternate form of contraception for a period of time before attempting to conceive. Many clinicians recommend 3 months although no precise information is available on which to base this recommendation. The administration of progestogen-only or progestogen-estrogen combinations to induce withdrawal bleeding should not be used as a test of pregnancy. 6. *Gallbladder Disease:* Studies report an increased risk of surgically confirmed gallbladder disease in users of OCs and estrogens. In one study, an increased risk appeared after 2 years of use and doubled after 4 or 5 years of use. In one of the other studies, an increased risk was apparent between 6 and 12 months of use. 7. *Carbohydrate and Lipid Metabolic Effects:* A decrease in glucose tolerance has been observed in a significant percentage of patients on OCs. For this reason, prediabetic and diabetic patients should be carefully observed while receiving OCs. An increase in triglycerides and total phospholipids has been observed in patients receiving OCs. The clinical significance of this finding remains to be defined. 8. *Elevated Blood Pressure:* An increase in blood pressure has been reported in patients receiving OCs. In some women, hypertension may occur within a few months of beginning OC use. In the first year of use, the prevalence of women with hypertension is low in users and may be no higher than that of a comparable group of nonusers. The prevalence in users increases, however, with longer exposure, and in the fifth year of use is two and a half to three times the reported prevalence in the first year. Age is also strongly correlated with the development of hypertension in OC users. Women who previously have had hypertension during pregnancy may be more likely to develop elevation of blood pressure when given OCs. Hypertension that develops as a result of taking OCs usually returns to normal after discontinuing the drug. 9. *Headache:* The onset or exacerbation of migraine or development of headache of a new pattern which is recurrent, persistent, or severe, requires discontinuation of OCs and evaluation of the cause. 10. *Bleeding Irregularities:* Breakthrough bleeding, spotting and amenorrhea are frequent reasons for patients discontinuing OCs. In breakthrough bleeding, as in all cases of irregular bleeding from the vagina, nonfunctional causes should be borne in mind. In undiagnosed persistent or recurrent abnormal bleeding from the vagina, adequate diagnostic measures are indicated to rule out pregnancy or malignancy. If pathology has been excluded, time or a change to another formulation may solve the problem. Changing to an OC with a higher estrogen content, while potentially useful in minimizing menstrual irregularity, should be done only if necessary since this may increase the risk of thromboembolic disease. Women with a past history of oligomenorrhea or secondary amenorrhea or young women without regular cycles may have a tendency to remain anovulatory or to become amenorrheic after discontinuation of OCs. Women with these preexisting problems should be advised of this possibility and encouraged to use other contraceptive methods. Post-use anovulation, possibly prolonged, may also occur in women without previous irregularities. 11. *Ectopic Pregnancy:* Ectopic as well as intrauterine pregnancy may occur in contraceptive failures. However, in progestogen-only OC failures, the ratio of ectopic to intrauterine pregnancies is higher than in women who are not receiving OCs, since the drugs are more effective in preventing intrauterine than ectopic pregnancies. 12. *Breast-Feeding:* OCs given in the postpartum period may interfere with lactation. There may be a decrease in the quantity and quality of the breast milk. Furthermore, a small fraction of the hormonal agents in OCs has been identified in the milk of mothers receiving these drugs. The effects, if any, on the breast-fed child have not been determined. If feasible, the use of OCs should be deferred until the infant has been weaned. **PRECAUTIONS: General:** 1. A complete medical and family history should be taken prior to the initiation of OCs. The pretreatment and periodic physical examinations should include special reference to blood pressure, breasts, abdomen and pelvic organs, including Papanicolaou smear and relevant laboratory tests. As a general rule, OCs should not be prescribed for longer than 1 year without another physical examination being performed. 2. Under the influence of estrogen-progestogen preparations preexisting uterine leiomyomata may increase in size. 3. Patients with a history of psychic depression should be carefully observed and the drug discontinued if depression recurs to a serious degree. Patients becoming significantly depressed while taking OCs should stop the medication and use an alternate method of contraception in an attempt to determine whether the symptom is drug related. 4. OCs may cause some degree of fluid retention. They should be prescribed with caution, and only with careful monitoring, in patients with conditions which might be aggravated by fluid retention, such as convulsive disorders, migraine syndrome, asthma, or cardiac or renal insufficiency. 5. Patients with a past history of jaundice during pregnancy have an increased risk of recurrence of jaundice while receiving OC therapy. If jaundice develops in any patient receiving such drugs, the medication should be discontinued. 6. Steroid hormones may be poorly metabolized in patients with impaired liver function and should be administered with caution in such patients. 7. OC users may have disturbances in normal tryptophan metabolism which may result in a relative pyridoxine deficiency. The clinical significance of this is yet to be determined. 8. Serum folate levels may be depressed by OC therapy. Since the pregnant woman is predisposed to the development of folate deficiency and the incidence of folate deficiency increases with increasing gestation, it is possible that if a woman becomes pregnant shortly after stopping OCs, she may have a greater chance of developing folate deficiency and complications attributed to this deficiency. 9. The pathologist should be advised of OC therapy when relevant specimens are submitted. 10. Certain endocrine and liver function tests and blood components may be affected by estrogen-containing OCs: a. Increased sulfobromophthalein retention; b. Increased prothrombin and factors VII, VIII, IX, and X; decreased antithrombin 3; increased norepinephrine-induced platelet aggregability; c. Increased thyroid binding globulin (TBG) leading to increased circulating total thyroid hormone, as measured by protein-bound iodine (PBI), T4 by column, or T4 by radioimmunoassay. Free T3 resin uptake is decreased, reflecting the elevated TBG, free T4 concentration is unaltered; d. Decreased pregnanediol excretion; e. Reduced response to metyrapone test. **INFORMATION FOR THE PATIENT:** See Patient Labeling. **DRUG INTERACTIONS:** Reduced efficacy and increased incidence of breakthrough bleeding have been associated with concomitant use of rifampin. A similar association has been suggested with barbiturates, phenylbutazone, phenytoin sodium, tetracycline, and ampicillin. **CARCINOGENESIS, PREGNANCY, NURSING MOTHERS:** See Contraindications and Warnings sections. **ADVERSE REACTIONS:** An increased risk of the following serious adverse reactions has been associated with the use of OCs (see Warnings): Thrombophlebitis; pulmonary embolism; coronary thrombosis; cerebral thrombosis; cerebral hemorrhage; hypertension; gallbladder disease; benign hepatomas; congenital anomalies. There is evidence of an association between the following conditions and the use of OCs, although additional confirmatory studies are needed: Mesenteric thrombosis; neuro-ocular lesions, eg, retinal thrombosis and optic neuritis. The following adverse reactions have been reported in patients receiving OCs and are believed to be drug related: Nausea and/or vomiting, usually the most common adverse reactions, occur in approximately 10 percent or less of patients during the first cycle. Other reactions, as a general rule, are seen much less frequently or only occasionally: Gastrointestinal symptoms (such as abdominal cramps and bloating); breakthrough bleeding; spotting; change in menstrual flow; dysmenorrhea; amenorrhea during and after treatment; temporary infertility after discontinuance of treatment; edema; chloasma or melasma which may persist; breast changes: tenderness, enlargement and secretion; change in weight (increase or decrease); change in cervical erosion and cervical secretion; possible diminution in lactation when given immediately postpartum; cholestatic jaundice; migraine; increase in size of uterine leiomyomata; rash (allergic); mental depression; reduced tolerance to carbohydrates; vaginal candidiasis; change in corneal curvature (steepening); intolerance to contact lenses. The following adverse reactions have been reported in users of OCs, and the association has been neither confirmed nor refuted: Premenstrual-like syndrome; cataracts; changes in libido; chorea; changes in appetite; cystitis-like syndrome; headache; nervousness; dizziness; hirsutism; loss of scalp hair; erythema multiforme; erythema nodosum; hemorrhagic eruption; vaginitis; porphyria; hemolytic uremic syndrome.
ACUTE OVERDOSE: Serious ill effects have not been reported following acute ingestion of large doses of OCs by young children. Overdosage may cause nausea, and withdrawal bleeding may occur in females. **HOW SUPPLIED:** Loestrin **21** 1/20 is available in dispensers each containing 21 tablets. Each tablet contains 1 mg of norethindrone acetate and 20 mcg of ethinyl estradiol. Available in packages of five dispensers. Loestrin **Fe** 1/20 is available in dispensers each containing 21 white tablets and 7 brown tablets. Each white tablet contains 1 mg of norethindrone acetate and 20 mcg of ethinyl estradiol. Each brown tablet contains 75 mg ferrous fumarate. Available in packages of five dispensers. Loestrin **21** 1.5/30 is available in dispensers each containing 21 tablets. Each tablet contains 1.5 mg of norethindrone acetate and 30 mcg of ethinyl estradiol. Available in packages of five dispensers. Loestrin **Fe** 1.5/30 is available in dispensers each containing 21 green tablets and 7 brown tablets. Each green tablet contains 1.5 mg of norethindrone acetate and 30 mcg of ethinyl estradiol. Each brown tablet contains 75 mg ferrous fumarate. Available in packages of five dispensers.
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Cover design: Clarke-Thompson.

Letters from Readers

On Natural Family Planning

I was pleased to see that natural family planning is being regarded more positively by *Family Planning Perspectives*, witness the article by [Jacqueline Darroch] Forrest and [Jane] Silverman [**21**:65, 1989] in the March/April 1989 issue. . . . [May] I respectfully point out that the reporting of the failure rate . . . of natural family planning methods attributed to Trussell and Kost* suggests that the 10 percent are method failures ("when used correctly and consistently"), while in fact [James] Trussell and [Kathryn] Kost do not differentiate between method-related and user-related pregnancies? User-related pregnancies, as I'm sure you agree, are not the same as those encountered when any method is used correctly and consistently. . . .

Hanna Klaus
Executive Director
Natural Family Planning Center
of Washington, D.C., Inc.

Dr. Forrest Replies:

The Trussell and Kost estimate used in the article is meant to indicate what is sometimes referred to as the method failure rate. They estimate that under conditions of perfect user compliance (i.e., if couples used a method correctly and consistently for one year), 10 percent or fewer of users would become pregnant unintentionally, depending on the specific method of natural family planning that was used.

Pregnancy rates among real-life users are actually higher than these estimated method failure rates. In the Trussel-Kost article, for example, the authors also estimate that about 20 percent of typical users of natural family planning become pregnant unintentionally in the first year of use.

In the May/June issue of *Family Planning Perspectives* [**21**:103, 1989], Elise F. Jones and I reported the results of a study showing that among all users of natural family planning in the United States during the period 1979–1982, 16 percent became pregnant unintentionally in the first year of use.

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*J. Trussell and K. Kost, "Contraceptive Failure in the United States: A Critical Review of the Literature," *Studies in Family Planning*, **18**:237, 1987.

Note to Authors

Family Planning Perspectives is a peer-reviewed bimonthly journal publishing research articles about the United States and other countries in the developed world that are intended to be of practical assistance to professionals in the fields of family planning, population studies and maternal and child health. The editors invite researchers, policymakers and program operators to submit articles on such topics as contraceptive practice and research; fertility levels, trends and determinants; adolescent pregnancy; abortion; public policies and legal issues affecting family planning and childbearing; family planning program operation, development and evaluation; information, education and communication activities; sexually transmitted diseases; and reproductive, maternal and child health. Manuscripts should be sent to the address below, and should include the complete affiliation, address, telephone number and Fax number (if possible) of the author with whom we are to correspond.

Manuscripts are read with the understanding that they neither are under consideration elsewhere nor have been published previously. All submissions are reviewed by the editorial staff and, if deemed of interest, undergo anonymous peer review. Manuscripts not accepted for publication will not be returned. Upon acceptance, all manuscripts will be edited to the extent necessary to conform to the style of the journal. Authors will have two opportunities to review their article after it has been edited. Authors must assign copyright to the journal.

Text Preparation

Manuscripts should be typed double-spaced, with all pages numbered and with a title page that includes the names and affiliations (at the time of the work reported) of all authors. Submissions should run no more than 30–35 pages, with no more than 7–8 tables; only one copy need be sent. Manuscripts should include a summary of no more than one page in length.

Once a submission has been accepted, the authors are asked to send (if available) a floppy disk containing an electronic version of the article. Ideally, this should be a Macintosh file on a 3.25-inch disk; an IBM-compatible 5-inch disk may also be used if the files are stored as "text only" or in an ASCII format.

Tables and Charts

Each table and chart should be on a separate page. Authors should check previous issues of *Family Planning Perspectives* to gain an idea of how tables are to be styled. Authors must supply data points for all line graphs and charts; final art work will be done by the journal.

References

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UPDATE

Florida Affirms Abortion Rights

In the space of a week in early October, antiabortion activists in Florida were dealt a pair of serious blows. The first came on October 5, 1989, when Florida's supreme court struck down a state law requiring teenage girls to have both parents' consent before obtaining an abortion.[1] Because the court found the law to violate the *state's* constitutional provision guaranteeing a citizen the "right to be [left] alone and free from governmental intrusion into his [or her] private life," the decision cannot be appealed to the U.S. Supreme Court. The second event came almost one week later, when the Florida legislature, called into a special session by Governor Bob Martinez to consider a set of bills intended to restrict the availability of abortion in Florida, rejected all eight measures in committee.[2]

[1] N. A. Harris, "Florida Court Rules Against Abortion Curbs," *New York Times*, Oct. 6, 1989, p. A15.

[2] J. Schmalz, "Abortion Access Stands in Florida," *New York Times*, Oct. 12, 1989, p. A23.

British Okay Fetal Tissue Transplants

A review committee established by the British health ministry to evaluate the ethics of the use of fetal tissue transplants has concluded that clear distinctions can be made between abortion and the use of fetal tissues, and that such use is not inherently immoral because the tissues are taken from aborted fetuses.[1] Echoing the conclusions of a panel established last year by the U.S. government to ponder the same issues,[2] the British committee recommended that the government permit research into the use of fetal tissue to treat a wide variety of diseases and conditions. It stipulated, however, that women having an abortion must explicitly consent to the use of the fetal tissue, that their decision to do so must be well separated from their decision to have an abortion and that an organization should be set up to serve as a middleman between abortion providers and the researchers who use the fetal tissue. While the British government fully accepted the panel's conclusions and has promised to act on them, the U.S. government has as yet not reacted to its panel's recommendations, even though they were made at least nine months ago.

[1] D. Dickson, "Fetal Tissue Transplants Win U.K. Approval," *Science*, **245**:464, 1989; and D. Brahams, "Research on Fetal Tissues," *Lancet*, **2**:342, 1989.

[2] R. B. Gold and D. Lehrman, "Fetal Research Under Fire: The Influence of Abortion Politics," *Family Planning Perspectives*, **21**:6, 1989.

Congress Cancels Sex Survey

AIDS researchers, among others, must wait a little longer to find out about American sexual behavior. Despite endorsements from agencies as disparate as the National Academy of Sciences, the General Accounting Office and the President's Commission on the Human Immunodeficiency Virus Epidemic, funding for a controversial study of sexual attitudes and activity was cut from the budget this summer by the House Appropriations Committee.[1] It was subsequently deleted by the Senate Appropriations Committee as well, although committee members stipulated in their report that they looked forward to a pilot study's being conducted. The main reason for its deletion was that some congressmen have objected to the explicit nature of the questions included in the survey questionnaire, which was to have been given to 2,300 people in a 1990 pretest and then to about 20,000 people over a two-year period in the early 1990s. Supporters of the survey expect to try for approval again next year. Until then, researchers must rely on information on sexual behavior gathered in the 1940s by Alfred Kinsey.

[1] "Sexual Behavior Survey," *Population Today*, Vol. 17, No. 9, p. 4.

Fetus Jailed Illegally?

The Missouri abortion law upheld by the U.S. Supreme Court in July is facing its first test in an odd lawsuit brought by a Missouri attorney in August against the Missouri Department of Corrections. Citing the preamble to the law stating that life begins at conception, the suit charges that an "unnamed, unknown fetus" carried by a woman imprisoned for theft and forgery is being illegally incarcerated because it has committed no crime, has not had benefit of legal counsel and has never been tried.[1] Although this argument is expected to be dismissed by the U.S. District Court scheduled to hear the case, the lawsuit also claims that this and other incarcerated fetuses are being denied adequate nutrition and medical care as a result of being jailed, and this issue may be considered more seriously by the court.

[1] D. M. Gianelli, "Missouri Suit Charges Fetus Illegally Imprisoned," *American Medical News*, Aug. 18, 1989, p. 12.

The First 100,000 AIDS Cases

In June 1981, the first cases of AIDS in the United States were diagnosed; in July 1989, AIDS case number 100,000 was identified.[1] Although it took from June 1981 to December 1987 for the first 50,000 cases to be reported, the second 50,000 were identified in only 18 months—between December 1987 and July 1989. An analysis of the first 100,000 AIDS cases reveals that more than 59,000 of the first 100,000 people identified as having AIDS have died. The majority of AIDS diagnoses still are made among homosexual or bisexual men who are not intravenous (IV) drug users, but the proportions of women who are sexual partners of high-risk men diagnosed with AIDS continue to increase. Finally, the data clearly show the extent to which AIDS has become established in the minority com-

UPDATE

munity: Blacks and Hispanics represented 18 percent of the 1980 U.S. population, but they make up 41 percent of all AIDS cases diagnosed since 1981, 78 percent of all cases among IV drug users, 75 percent of all cases among sexual partners of IV drug users and 85 percent of cases among children of IV drug users or of their sexual partners.

[1] "First 100,000 Cases of Acquired Immunodeficiency Syndrome—United States," *Morbidity and Mortality Weekly Report*, **38**:561, 1989.

Anemia Unrelated to Preterm Delivery

Research published in 1987 suggested that maternal anemia was related to a four times greater risk of preterm delivery, and that nearly two-thirds of the difference between blacks and whites in the incidence of preterm delivery could be attributed to anemia.[1] However, a large-scale study involving more than 35,000 pregnancies has not only failed to confirm this finding, but has also suggested a possible explanation for it.[2] Hematocrit appears to be depressed at about 28–30 weeks of gestation and rises thereafter; thus, comparing hematocrit at preterm labor with hematocrit at term labor produces a spurious association between low hematocrit and risk of preterm birth. The investigators conclude that since anemia is both easily detected and easily treated, "it would be fortunate indeed if a problem as important as the ethnic difference in preterm birth could be remedied simply by treating anemia. Unfortunately, traditional medical risk factors do not explain these differences."

[1] E. Lieberman et al., "Risk Factors Accounting for the Racial Differences in the Rate of Premature Birth," *New England Journal of Medicine*, **317**:743, 1987.

[2] M. A. Klebanoff et al., "Facts and Artifacts about Anemia and Preterm Delivery," *Journal of the American Medical Association*, **262**:511, 1989.

The Price of AIDS

In 1987, more than 27,000 AIDS patients were treated as inpatients at U.S. hospitals, at an estimated average cost of $486 million (not including physicians' fees).[1] A detailed study of the cost of AIDS shows that public hospitals treated more than twice as many patients, on average, as private hospitals, and that 10 percent of all hospitals treated 58 percent of AIDS patients. Medicaid and private insurance paid for 44 percent and 29 percent of all admissions, respectively. Unfortunately, only about 80 percent of the cost of treating AIDS patients could be recovered through Medicaid, Medicare, private insurance or private payments; the difference per day between the cost of treatment and the payments received was significantly greater for AIDS patients than for other medical or surgical patients ($136 per day vs. $26 per day). The investigators conclude that "if current trends prevail, the generally inner-city hospitals where AIDS patients are concentrated may find their ability to provide health services in general severely compromised. . . . Without an equitable distribution of the burden of care for low-income persons with AIDS, hospitals with a disproportionate share of these patients face an economic crisis."

[1] D. P. Andrulis, V. B. Weslowski and L. S. Gage, "The 1987 U.S. Hospital AIDS Survey," *Journal of the American Medical Association*, **262**:784, 1989.

STDS and Cervical Cancer

The hypothesized link between genital infection and cancer of the cervix, as well as the potential of barrier methods for prevention of cervical cancer, received further support recently from a Utah case-control study involving nearly 800 women.[1] Women who had had 10 or more sexual partners were nine times more likely to have been diagnosed with carcinoma in situ or invasive cervical cancer than were those who had had one or no sexual partners, as were women whose regular partners had had 10 or more sexual partners. Women with a history of herpes infection were three times as likely and those with a history of *Trichomonas* infection were twice as likely to have had cervical cancer. On the other hand, women who had relied on spermicides were almost 60 percent less likely to have had cervical cancer. Among women who had had more than one sexual partner, those who had used the condom were half as likely and those who had used the diaphragm were one-third less likely to have had cervical cancer.

[1] M. L. Slattery et al., "Sexual Activity, Contraception, Genital Infections, and Cervical Cancer: Support for a Sexually Transmitted Disease Hypothesis," *American Journal of Epidemiology*, **130**:248, 1989.

New Help for PMS Sufferers

A British trial has shown that a combined regimen of estradiol patches worn for one and one-half months and regular administration of a progestin substantially relieved the depression and distress associated with premenstrual syndrome.[1] Twenty women used hormonally active patches for three months and then inactive patches (as placebos) for three months, and another 20 were given inactive patches and then active patches; all participants received doses of norethisterone on days 19–26 of each cycle. The women treated with the active patches felt significantly less pain, were less irritable, were better able to concentrate and reported feeling less tense. A few of the women said that the skin under the patch had become discolored, but there were no other side effects, and the researchers concluded that the regimen "is an effective treatment for premenstrual syndrome."

[1] N. R. Watson et al., "Treatment of Severe Premenstrual Syndrome with Oestradiol Patches and Cyclical Oral Norethisterone," *Lancet*, **2**:730, 1989.

No Link Between Vitamins, Birth Defect

Although some have claimed in recent years that women who take vitamins around the time of conception are at a reduced risk of bearing a child with neural tube defects, a study sponsored by the National Institute of Child Health and Human Development has found no such association.[1] Women who gave birth to a normal child were just as likely as those who did not to have taken multivitamins (either as pills or in fortified cereals) or supplementary folic acid (another vitamin) around the time of conception. There was no association even after logistic regression was used to adjust for the influence of employment status, education, income, race or ethnic background or trimester in which prenatal care was begun. The researchers' conclusion: "Our results should not be taken to mean that vitamin supplements are of no benefit in high-risk populations. . . . [However,] the use of vitamin supplements by American women in the periconceptional period is unlikely to lead to any important reduction in the frequency of neural-tube defects."

[1] J. L. Mills et al., "The Absence of a Relation Between the Periconceptional Use of Vitamins and Neural-Tube Defects," *New England Journal of Medicine*, **321**:430, 1989.

Correction

In an Update item entitled "Douching Popular Among Teenagers," [**21**:150, 1989], the family planning clinic in the study was incorrectly referred to as a Planned Parenthood clinic. In fact, it operates under the auspices of Baylor College of Medicine's population program.

Adolescent Childbearing and High School Completion in the 1980s: Have Things Changed?

By Dawn M. Upchurch and James McCarthy

Summary

More adolescent mothers are now graduating from high school than ever before. Since the 1950s, the high school completion rate of women who became mothers at age 17 or younger has nearly tripled—from 19 percent in 1958 to 56 percent in 1986. However, graduation rates did not increase equally for all racial and socioeconomic groups, and the increases did not occur in the same periods for all groups.

Black mothers who were school-age when they had their first child made their greatest gains in graduation rates between 1958 and 1975, while their white counterparts made their greatest gains between 1975 and 1986. By 1986, black women who were 17 or younger when their first child was born were more likely to have graduated than similar white women—61 percent and 54 percent, respectively. Nevertheless, when overall levels of high school graduation are considered, white women were more likely than black women to have graduated. Regardless of race, women from more advantaged backgrounds were more likely to be graduates than were those from less advantaged backgrounds, and the younger the women were when their first child was born, the less likely they were to be graduates.

Introduction

As adolescent childbearing became the focus of social concern in the late 1960s and early 1970s, a rapidly growing body of literature suggested that it was associated with a series of adverse social consequences, including truncated education.[1] Although this research suggested that adolescent mothers were at a disadvantage at every educational level and did not appear to catch up over time, their high school completion rates showed the most direct effects of teenage childbirth.[2] The studies explored the experiences of adolescent women in the 1950s, the 1960s and the early 1970s; since the studies were conducted, a new generation has been exposed to the risks of teenage parenthood and dropping out of school.

Over the last 15 years, institutional and societal changes may have weakened the association between adolescent childbearing and high school dropout. One such change was the passage of Title IX of the Educational Amendment Act of 1972, which directly affected how pregnant and parenting teenagers were treated in public high schools. This legislation, which took effect in 1975, made it illegal for schools receiving federal funds to expel students because of pregnancy or parenthood. In addition, a wide variety of programs for pregnant and parenting teens have been developed and implemented.[3] Changing marital patterns and more tolerant social norms have made adolescent childbearing more "visible" and also, perhaps, less socially stigmatizing.

Furthermore, over the past 30 years, women as a group have become increasingly educated. This trend is reflected in the rising percentages of women graduating from high school: In 1985, close to 87 percent of women aged 25–29 had a high school diploma, compared with only two-thirds of similar women in 1958.[4] The extent to which young mothers shared in this overall increase, however, is not clear.

Given this changing social context, a reanalysis of the relationship between adolescent childbearing and high school completion seems warranted. Increasing levels of education in the population may reduce the value of a high school diploma, but high school graduation is still a significant milestone in an educational career and a minimal requirement for many jobs and for further education.

Some studies have addressed the association between early childbearing and schooling in recent cohorts: Frank Mott and Nan Maxwell, for example, found that adolescent mothers in 1979 were substantially more likely to be enrolled in school during the months just before and after a birth than were similar mothers in 1968.[5] The authors did not determine, however, whether these women were also more likely than their earlier counterparts to graduate from high school. Although more recent work by Mott and William Marsiglio suggests that the relationship between adolescent childbearing and dropping out of school persists,[6] no studies have actually compared the high school graduation rates of young mothers in the 1960s and 1970s with those of similar mothers in the 1980s.

The study described here addresses changes in the association between age at first birth and high school graduation in the period between 1958 and 1986. Our research focused both on absolute increases in percentages of young mothers graduating and on how these gains compared with increases in high school graduation rates among women who delayed childbearing beyond the secondary school years.* Previous research has demonstrated the importance of considering both absolute and relative increases in education; one study found that although

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*In this article, we present descriptive data related to the association between early childbearing and high school graduation, leaving analyses of whether adolescent childbearing actually causes student attrition for further research.

Table 1. High school graduation rates among women aged 21–29, by age at first birth, according to race and year, United States, 1958, 1975 and 1986

Race and year	Age at first birth					
	All	≤17	18–19	20–24	25–29	No birth
All women						
1958	70.0	18.6	51.2	80.6	82.7	79.4
1975	82.8	29.2	65.2	88.5	96.4	93.1
1986	89.2	55.5	74.6	90.8	96.0	96.2
Whites						
1958	73.4	19.6	55.1	81.8	84.1	79.8
1975	85.0	24.5	65.7	89.4	97.2	94.2
1986	90.3	53.7	74.4	90.4	96.0	96.5
Blacks						
1958	41.4	16.6	31.0	60.7	64.4	74.1
1975	67.3	37.4	63.2	80.2	83.9	82.1
1986	82.7	60.6	75.3	92.7	96.8	92.8

Notes: The 1958 data are from the NLS Mature Women sample, ages 30–38 in 1967 (N=2,248). In this and subsequent tables, the 1975 data are from the NLS Young Women sample, ages 14–22 in 1968 (N=3,558), and the 1986 data are from the NLS Youth sample (women), ages 14–22 in 1979 (N=4,488). In this and subsequent tables, all percentages have been weighted to national estimates. The weights used for the NLS Young Women sample and the NLS Youth sample represent the calendar year in which these women were 21–29 years old (1975 and 1986, respectively). However, for the NLS Mature Women sample, the weights used represent the calendar year in which these women were 40–48 years old (1977), not when they were actually 21–29.

women who had begun childbearing at a young age were completing more years of education, their educational disadvantage persisted because women who had had no children or who had started childbearing at older ages were also increasing their years of education.[7]

Table 2. High school graduation rates among women aged 21–29, by age at first birth, according to background characteristics and year, 1975 and 1986

Background characteristics and year	Age at first birth					
	All	≤17	18–19	20–24	25–29	No birth
Mother's education						
<12 years						
1975	71.1	20.7	52.9	82.2	91.8	87.0
1986	77.9	50.0	70.1	84.5	88.7	88.3
≥12 years						
1975	93.9	52.2	83.8	96.2	98.7	97.0
1986	95.4	71.5	81.3	95.4	98.1	98.7
Family intact						
No						
1975	69.1	24.3	59.9	79.4	96.3	87.9
1986	79.2	45.2	69.6	83.6	84.7	92.0
Yes						
1975	85.8	32.3	67.2	90.9	96.4	94.1
1986	92.5	64.2	77.1	93.8	97.7	97.2
Cultural index						
0–1						
1975	56.9	20.5	44.2	74.2	78.5	74.1
1986	74.3	42.7	65.4	81.6	95.6	88.3
2–3						
1975	87.7	35.1	72.4	90.9	98.2	95.2
1986	92.5	64.5	78.3	93.1	95.9	97.2
Urban residence						
No						
1975	82.2	24.9	65.7	90.0	96.9	93.7
1986	89.0	47.8	76.7	92.3	97.4	97.0
Yes						
1975	83.4	35.7	64.4	86.4	95.8	92.6
1986	89.2	58.1	73.8	90.3	95.5	95.9

Data and Methods

The data used in this analysis were obtained from three separate surveys of women, all part of the National Longitudinal Surveys (NLS) of Labor Market Experience.[8] In the first survey (the NLS of Mature Women), interviews were conducted in 1967 with over 5,000 women aged 30–44 and were continued biennially through the late 1980s. For the second survey (the NLS of Young Women), women aged 14–24 were originally interviewed in 1968; annual interviews have continued through the late 1980s. Data on the youngest group of women were collected in the NLS of Youth, first administered in 1979 to over 12,000 men and women aged 14–22; over 6,200 women were originally interviewed. In all of these nationally representative surveys, blacks were oversampled to allow for racial comparisons.

These three surveys contain data on the experiences of several birth cohorts of American women over a lengthy span of time. For the purposes of this study, we chose to focus on the experiences of the women in each group at the time they were 21–29 years old, which allows for the most comparable data across surveys. Thus, the women we selected for analysis from the NLS Mature Women sample were those aged 30–38 in 1967 (excluding those who were 39–44): These women, who were 21–29 years old in 1958, were adolescents in the 1940s and 1950s. From the NLS Young Women sample, we chose women who were 21–29 in 1975; these women grew up in the 1960s and early 1970s (prior to most of the policy, institutional and societal changes discussed previously). Finally, the youngest group, those interviewed in the NLS of Youth, were 21–29 in 1986 (the most recent year for which data were available). These women were adolescents in the late 1970s and the early 1980s.

The study comprised 2,248 women (1,630 whites and 618 blacks) from the NLS Mature Women sample, 3,558 women (2,529 whites and 1,029 blacks) from the NLS Young Women sample and 4,488 women (3,099 whites and 1,389 blacks) from the NLS Youth sample. Although the NLS of Youth included Hispanic women, the other surveys did not; therefore, we omitted Hispanic women from our analyses. The percentages in all the tables have been weighted to represent national estimates.

Using all three samples of women, the first analysis looks at high school completion rates in 1958, 1975 and 1986, a 29-year span. For each of these three years, we can examine the high school and childbearing experiences of one of the three samples of women when they were 21–29 years old. This analysis addresses three general questions: How has the percentage of women graduating from high school changed from 1958 to 1986? How have adolescent mothers fared in comparison with women who delay childbearing? And finally, what are the racial differences in the patterns of high school graduation, particularly among adolescent mothers? The second analysis, which focuses on the 1975–1986 period, addresses the same questions but also examines socioeconomic differences in high school graduation rates by age at first birth.

The outcome variable of interest, high school graduation, is measured as a dichotomy—that is, whether or not the women completed 12 or more years of schooling. This measure of high school completion includes both regular and high school equivalency diplomas. The major covariate of interest is age at first birth.

The background characteristics considered in the second analysis are mother's education, family structure, availability of reading materials and residence. We chose to use mother's education rather than father's education as a measure of socioeconomic status, because almost half of the black women in the NLS Youth sample were from single-parent households. For these women, mother's education is undoubtedly more salient than father's education, and the information is less often missing. Family structure was measured by whether or not a woman was living with both of her natural parents when she was 14. A "cultural index" measuring the amount of reading material in the home when the woman was age 14 varies from 0 to 3; for this analysis, it was dichotomized (0–1 and 2–3). Finally, we noted whether or not a woman was living in an urban area when she was 14.

Results

Table 1 shows the trends in graduation rates, by race and by age at first birth, for women who were 21–29 years old in 1958, 1975 or 1986. Between 1958 and 1986, high school graduation rates among women in that age group increased steadily. In 1958, 70 percent of women were graduates, compared with almost 90 percent by 1986. Overall, the largest increase in the graduation rate occurred between 1958 and 1975.

The analysis also revealed another pattern that was remarkably consistent across the years: the younger the age at first birth, the lower the percentage of women graduating from high school. However, although in 1986 the mothers who had been 17 or younger at first birth were still the group least likely to have graduated from high school, they were also the group with the largest gains in their graduation rate.

There were substantial racial differences both in the patterns of the trend and in the absolute percentages of adolescent (defined, for our purposes, as 17 or younger) mothers graduating from high school. Overall, in all three years, white women were more likely than black women to be high school graduates. However, in 1975 and 1986, black women who were 17 or younger when their first child was born were more likely to graduate than similar white women. Among women who delayed childbearing until at least age 20, white women were more likely than black women to be graduates in 1958 and 1975, but by 1986, these racial differences had disappeared.

These results reflect interesting racial differences in changes in high school completion rates. Between 1958 and 1975, the graduation rates of white mothers 17 or younger at first birth rose from 20 percent to 25 percent, an increase (25 percent) slightly greater than that among all white women (from 73 percent to 85 percent, an increase of about 16 percent). In contrast, between 1975 and 1986, the increase in the graduation rate of white mothers 17 or younger at first birth far exceeded the gains of white women overall—almost 120 percent (from 25 percent to 54 percent), compared with only six percent (from 85 percent to 90 percent).

On the other hand, black women who were adolescents when their first child was born made their greatest gains from 1958 to 1975 (from 17 percent to 37 percent, an increase of about 125 percent), a period during which graduation rates among black women overall increased 63 percent. Although the increase between 1975 and 1986 among these mothers was also substantial (62 percent), it was not as great as in the earlier period; the graduation rate for all black women during this later period increased 23 percent. Therefore, in both periods, the increase among black women who became mothers during adolescence was substantially greater than the increase among all black women, suggesting that little of the increase among young black mothers was the result of an overall increase in the percentage of black women graduating.

Table 2 shows the relationship between age at first birth and high school completion for the two youngest samples of women when the data are stratified by a number of characteristics that indicate whether the young women came from more advantaged or more disadvantaged backgrounds. Again, the patterns of that relationship are quite consistent across the years. Overall, women who had been younger at first birth were less likely to have graduated than were women who had delayed childbearing, and women from more advantaged backgrounds were more likely than women from less advantaged backgrounds to have graduated. For example, in 1975, 21 percent of mothers 17 or younger at first birth whose own mothers had completed fewer than 12 years of schooling were high school graduates, compared with 52 percent of adolescent mothers whose own mothers had completed 12 or more years of schooling. In the group of women who were youngest at first birth, those from intact families were more likely to have graduated than those from families in which both parents had not been present. The amount of reading material available to a young woman also appeared to influence whether or not she would graduate: Those from households in which there had been few or no reading materials were less likely to have graduated than were those from homes in which more reading materials had been available. Finally, mothers 17 or younger at first birth who had been raised in urban areas were more likely than those raised in nonurban areas to have graduated.

A second pattern shows that between 1975 and 1986, the proportion of graduates among women who had become mothers during adolescence increased for each background characteristic measured and that the increase was greatest among those from more disadvantaged backgrounds. For example, the graduation rate for mothers 17 or younger at first birth whose own mothers had fewer than 12 years of schooling increased from almost 21 percent in 1975 to 50 percent in 1986, an increase of about 140 percent. On the other hand, young mothers from more advantaged backgrounds had the highest absolute percentages of graduates by 1986. The graduation rate for mothers 17 or less at first birth whose own mothers had 12 or more years of schooling increased from 52 percent to 72 percent; however, this was an increase of only about 37 percent.

Important racial differences in graduation patterns and trends among young mothers are described earlier in this article. Table 3 (page 202) provides a more detailed description of these patterns for the 1975–1986 period focusing on the education of the respondents' mothers.

The general patterns are very similar to those already described. Women who had delayed childbearing beyond the adolescent years were more likely than those who had not to have graduated; women from more advantaged backgrounds were more likely to be graduates than women from less advantaged backgrounds; and, in general, the percentage of women who were

Table 3. High school graduation rates among women aged 21–29, by race and mother's education, according to age at first birth and year, 1975 and 1986

Age at first birth and year	Whites		Blacks	
	<12 years	≥12 years	<12 years	≥12 years
All				
1975	72.7	94.4	64.5	83.8
1986	78.4	95.8	76.4	91.8
≤17				
1975	15.0	45.6	30.2	67.4
1986	47.2	70.8	56.4	75.6
18–19				
1975	50.5	85.6	60.8	69.2
1986	69.5	80.5	71.7	84.6
20–24				
1975	82.9	96.1	78.8	98.4
1986	83.2	95.2	89.1	97.0
25–29				
1975	92.5	99.2	86.5	80.0
1986	86.9	98.3	100.0	91.6
No birth				
1975	88.3	97.1	80.4	95.3
1986	88.2	98.7	88.6	97.4

graduates increased from 1975 to 1986 for all age-at-first-birth categories.

In addition, the data for the white mothers who were youngest at first birth show two patterns. First, from 1975 to 1986, the percentage of these women graduating increased within socioeconomic class, from 15 to 47 percent among those from the lower socioeconomic level (a 215 percent increase) and from 46 to 71 percent among those from the higher level (a 55 percent increase). Second, those from less advantaged backgrounds made larger relative gains between the two years than did those from more advantaged backgrounds.

Among blacks, the general pattern of rising graduation rates with increasing age at first birth also held true. Again, as the data for those youngest at first birth show, the percentages who had graduated increased from 1975 to 1986 within the two categories of mother's education. As was seen for whites, the largest relative increases in the proportion of graduates occurred among women from disadvantaged backgrounds who were adolescents at first birth—87 percent.

However, the relative gains among these black mothers were not nearly as great as those of their white counterparts, particularly for those women raised in more disadvantaged circumstances. The increase in the graduation rate among the white mothers from disadvantaged backgrounds was over 200 percent, compared with 87 percent for similar black mothers. Therefore, although among mothers of both races who had been adolescents at first birth, those sampled in 1986 were more likely to be high school graduates than those sampled in 1975, the increases between the two years were not uniform across socioeconomic levels, with disadvantaged white mothers making the greatest gains.

Discussion and Conclusions

The findings from this study suggest that the proportion of young mothers graduating from high school is higher now than ever before; by 1986, high school graduation was the norm. The data also show that the patterns and trends over the past 29 years have varied by race and social status and that increases in the proportion graduating have not been equally large for all groups of adolescent mothers.

Although the late 1970s and early 1980s brought a proliferation of programs and policies designed for adolescent mothers, the largest gains in high school completion for young black mothers occurred prior to that period. On the other hand, white adolescent mothers from disadvantaged backgrounds made very large gains in high school graduation rates between 1975 and 1986. Although educational opportunities for young mothers were greatly expanded during this period, the data available did not allow us to account specifically for the cause or causes of the observed increase in graduation rates among white adolescent mothers.

Another possible explanation for the variation in increases in high school graduation along race and socioeconomic lines is the change in marital patterns among young mothers. The greatest change in marital patterns among young black mothers occurred during the 1959–1975 period; that is, over the course of this interval, births were more and more likely to be nonmarital. On the other hand, the greatest shifts in marital patterns of young white mothers occurred in the 1975–1986 period.[9] Because prior studies suggest that early marriage independently reduces a young mother's chances of graduating,[10] the decreased association between adolescent childbearing and marriage may account for some of the gains these young mothers attained.

In light of these findings, should our perspective be one of pessimism or optimism? The majority of adolescent mothers in the 1980s are graduating from high school—as many as 75 percent among some groups of mothers. However, although there have been gains in high school completion rates among adolescent mothers, their educational disadvantage may not have changed when compared to women who delay childbearing.[11] In fact, Mott and Marsiglio found that adolescents who become mothers are less likely to continue their education in college.[12] It is still too early to answer this question for the youngest women in our sample, those who were 21–29 years old in 1986. Many of these women may simply complete their education at a later age. The trends reported in this article are significant, but do not provide a complete answer to questions about the association between age at first birth and educational attainment among recent generations of women. That answer must wait until these women are older.

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Sex, Contraception and Pregnancy Among Adolescents in Foster Care

By Denise F. Polit, Thomas D. Morton and Cozette Morrow White

Summary

Young women aged 13–18 who were surveyed in a 1986 study of child welfare clients were over 50 percent more likely to have had sexual intercourse than those in a comparison group drawn from a national sample of young women; they were also more than twice as likely to ever have been pregnant. The child welfare teenagers also scored significantly lower than their counterparts on a test of sexuality and birth control knowledge.

Among the child welfare clients (half of whom were at home and half of whom were in foster care), the young women living in foster homes were less likely than those living with their own families to have ever had sex voluntarily (33 percent vs. 47 percent). However, the foster children were less likely to have used birth control at their most recent intercourse or to have obtained contraceptives from a family planning clinic. Nearly half of the foster care teenagers and 40 percent of the teenagers living at home reported having been sexually abused. Victims of sexual abuse were especially likely to be sexually active.

Among blacks, the teenagers in foster care and their national counterparts were similar in the proportions who had had sexual intercourse, who had had voluntary intercourse and who had ever been pregnant. Among whites, however, the foster care teenagers were about four times as likely as their matched peers to have had intercourse and to have had voluntary sex, and they were almost eight times as likely to have been pregnant. Among blacks, the child welfare teenagers living at home were almost twice as likely as their matched peers to have ever been pregnant (24 percent vs. 14 percent), but among whites, the risk for the at-home teenagers was eight times as great (16 percent vs. 2 percent) as that for their counterparts from the national sample.

Young women who remain in their parents' homes despite some family dysfunction are more likely to engage in sexual activity than teenagers living in foster homes; foster parents may provide the teenagers with more stable environments.

Introduction

Nearly two million children in the United States are served each year by public child welfare agencies; about two-thirds of them have been abused or neglected by their parents. Most of these children are provided with in-home services designed to keep the family intact. Every year, however, nearly half a million children are placed in some form of alternative care, typically in foster homes.[1]

Child welfare clients, whether they remain in their homes or are placed elsewhere, appear to be at increased risk for early sexual activity and teenage pregnancy. Research has documented that the teenagers at greatest risk are those from poor, minority, single-parent homes,[2] a group disproportionately represented among child welfare clients.[3] Moreover, many child welfare clients have been sexually abused,[4] a factor that has been linked to overall sexual maladjustment and promiscuity.[5]

Teenagers in foster care may be especially at risk. Contemporary child welfare services strive to maintain children in their own homes whenever possible; children generally are removed from their homes only in cases of severe family dysfunction.[6] Foster children might therefore be expected to have greater emotional and behavioral difficulties. When there are serious family or personal problems, children in foster care often are not reunited with their families, and in many cases, these children are moved from one foster home to another. This is especially true for older children,[7] who are less likely to be adopted.

Little is known about the type of guidance that children in foster care receive in the area of sexuality from their foster parents and child welfare agency social workers, but there is some evidence that the sexual development needs of foster children are not being met. In a survey of state child welfare agencies, we found that only a few were systematically addressing the sexuality-related needs of these children.[8] An earlier study in Wisconsin suggested that neither foster parents nor caseworkers were providing much sexual guidance to the children in their care.[9] Furthermore, although the majority of children in foster care are eligible for free medical services (including family planning) through Medicaid, they have, in general, been found to receive inadequate health-related services.[10]

Consequently, there is reason to hypothesize that adolescents in the child welfare system—particularly teenagers who have been placed in foster care—are especially vulnerable to early sexual involvement and its consequences. The study described in this article explores this hypothesis by examining the sexual behavior, knowledge and attitudes of young women living in foster care and comparing them to those of two other groups: child welfare clients living at home and teenagers who had not been involved with the child welfare system.

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Table 1. Demographic and background characteristics of female child welfare teenagers, by residence status

Characteristic	All (N=177)	Foster care (N=90)	At home (N=87)
Means			
Age	15.7	15.7	15.6
Age at menarche	12.3	12.3	12.3
Mother's education (yrs.)	11.2	11.0	11.4
Father's education (yrs.)	11.7	11.3	12.0
Number of years lived with real mother	10.1****	7.0	13.3
Number of years lived with real father	5.0****	3.4	6.6
Number of siblings	4.1	4.4	3.7
Years of school completed	8.1	8.1	8.2
Number of months in care	38.1****	65.9	27.0
Number of months in current placement	na	32.2	na
Number of placements	na	4.1	na
Percentages			
White	36.2	35.6	36.8
Black	61.6	63.3	59.8
Fundamentalist Protestant	58.8	64.4	52.9
Very religious	51.4**	61.1	41.4
Expecting post-secondary education	42.2	39.3	45.4
Placed because of suspected child abuse/neglect	na	78.9	na

**Difference between foster care and at home groups significant at $p<0.05$.

****Difference between foster care and at home groups significant at $p<0.001$.

Note: na=not applicable.

Methods

The primary subjects for this study were 177 child welfare clients aged 13–18 who were living in two metropolitan areas of a large midwestern state. Two groups of these young women were sampled: those living with unrelated foster parents and those living at home with their parents or guardians but monitored by a caseworker.* The child welfare teenagers living at home were considered an especially relevant comparison group for the foster children because they were the same age, were from the same cities and had also experienced some type of family dysfunction.

A random sample of teenagers meeting the gender, age and residence criteria was selected by the state child welfare agency. Young women were excluded from the sample if information in the agency records indicated that they had a physical, emotional or learning impairment that would make it impossible or inadvisable for them to participate. The remainder were sent a letter inviting them to participate in the study through a personal interview, for which they would receive a $15 stipend. Nonrespondents were called to determine whether they had received the letter and whether they wished to participate.

Of the 576 teenagers who were invited to participate, 195 (34 percent) agreed to be interviewed. About half of the foster care teenagers responded positively, compared with 26 percent of the teenagers living at home.† Not all the young women who agreed to an interview actually took part in one, generally because of scheduling problems or a move prior to interviewer contact. The final sample consisted of 90 teenagers in foster care and 87 living at home.

Because the overall response rate was so low, possible selection biases were examined. Using information available in the agency records, the investigators compared teenagers who were interviewed with those who did not respond to the recruitment letter. In both the foster care and the at-home group, blacks made up a somewhat higher proportion of the respondents than of the nonrespondents. Among the foster care teenagers, the respondents and nonrespondents were comparable in age, reasons for placement, number of placements, length of stay in current placement and length of stay in the foster care system.

Among the teenagers living at home, those who agreed to participate in the study were somewhat less likely than those who did not to have come to the attention of child welfare agencies because of suspected sexual abuse (17 percent vs. 24 percent), and had been clients of the agencies for shorter periods of time. It thus seems likely that in comparison to the overall population of at-home teenagers from which they were drawn, the teenagers in our sample were less at risk for early sexual involvement and its consequences.

Data were collected from both groups of child welfare clients through one-hour personal interviews held in the teenagers' homes. The questionnaire drew heavily on the interview schedule used in John Kantner and Melvin Zelnik's 1979 National Survey of Young Women (NSYW).[11] Additional questions were asked about sexual abuse and about parent-child communication concerning sexuality and family planning.

Table 2. Percentage of female child welfare teenagers with selected sex-related attitudes and experiences, by residence status

Attitude or experience	Foster care (N=90)	At home (N=87)	Difference
Agrees that premarital sexual intercourse is never okay	47	29	18*
Believes a baby from a premarital pregnancy should be put up for adoption	39	23	16**
Ever kissed a boy	80	93	–13**
Ever had intercourse	41	54	–13
Has a steady boyfriend	36	56	–20***
Ever had any sexually abusive experience	48	38	10
Ever forced to have intercourse	18	14	4
Ever had uncoerced intercourse	33	47	--14**
Ever pregnant	13	20	–7
Ever gave birth	10	12	–2

*Difference significant at $p<0.10$.

**Difference significant at $p<0.05$.

***Difference significant at $p<0.01$.

The background characteristics of the final research sample are presented in Table 1. The two groups of young women were similar in age, race, religion, age at menarche, parental education, number of siblings and educational aspirations, all of which have been found to be related to the age at which sexual activity is begun. However, the at-home teenagers had been clients of the public child welfare agency for much shorter periods of time and were less likely to describe themselves as very religious.

To place the information received from the child welfare sample in a broader context, the investigators created a second comparison group using data from a subsample of the 1979 NSYW. This survey collected data from approximately 1,700 women 15–19 years old who lived in standard metropolitan statistical areas in the continental United States. This data set was used because it provides information on sexual activity, contraceptive use and nonuse, and premarital pregnancy and its resolution.

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*Children in these two groups accounted for 82 percent of the state's child welfare caseload in 1986, when the subjects were selected. The remaining 18 percent of the agency's cases included children living in foster care with relatives, in group homes, in residential treatment facilities or with their parents in "aftercare" (i.e., after a period of being in foster care).

†Although the 26 percent response rate for the at-home teenagers was disappointingly low, a much higher response rate is unlikely to be achievable with this population. For the at-home teenagers, parental permission to participate was required. These parents, whose risk of having their children removed from their homes is high, are unlikely to want to have their children discuss personal matters—especially relating to their sexuality—with strangers who have a link (albeit a very informal one) to the state child welfare agency.

The 177 teenagers from the child welfare sample and 177 teenagers from the NSYW sample were matched by marital status (all never-married), race, age and social class (as measured by parental education). The groups were found to be comparable on measures of religious affiliation, school status and employment status. However, they differed on other important characteristics: The NSYW teenagers were significantly older,* had completed more schooling, had higher educational expectations and lived in smaller households than either group of child welfare teenagers. All of these differences were statistically controlled in the analyses; however, because of the differences and because the data were not collected in the same years, the analyses should be considered suggestive rather than definitive.

Results

Despite their similar demographic characteristics, the two groups of child welfare clients were quite different in attitudes and behaviors relating to sex and contraception (Table 2). Nearly half of the foster care group, as opposed to 29 percent of the teenagers living at home, stated that sex before marriage is never okay. The foster care teenagers were also more likely to believe that an unintended premarital pregnancy should be resolved by giving the baby up for adoption.

Although similar proportions of the two groups had dated (not shown), the teenagers living at home were significantly more likely to have kissed a boy (93 percent vs. 80 percent) and were more likely to have had intercourse (54 percent vs. 41 percent). Only about one-third of the teenagers in foster care reported having a steady boyfriend at the time of the interview, compared with 56 percent of those living at home.

Nearly half of the foster care teenagers and 38 percent of the at-home teenagers acknowledged that they had been sexually abused. The most prevalent form of abuse was touching or fondling by an adult, but about one out of six teenagers in each group reported having been forced to have sexual intercourse. However, significantly more of those living at home (47 percent) than those in foster care (33 percent) had had sexual intercourse in a situation that did not involve coercion.

The two groups had similar pregnancy and childbearing histories. Of the sample as a whole, about 15 percent had been pregnant and about 10 percent had given birth. Among the teenagers who were sexually experienced, 40 percent had become pregnant and 25 percent had had a baby. Only a handful of the respondents reported having had an abortion, and all but one of those who had given birth were raising the baby themselves.

Table 3 presents more detailed information about the sexually experienced young women in the sample. The mean age at first intercourse was under 13 in both groups. A somewhat higher percentage of the foster care teenagers (35 percent) than the at-home teenagers (22 percent) had been younger than 13 when they first had intercourse; most of them had been victims of sexual abuse. The sexually experienced teenagers in foster homes had had, on average, two sexual partners, while those living at home had had three. This difference probably reflects, at least in part, the fact that nearly one-fifth of the sexually experienced teenagers in foster care (compared with 10 percent of those living at home) had never had sexual intercourse voluntarily. The teenagers who were living with their own families also had had intercourse nearly twice as many times in the past three months as had the foster care teenagers. None of these differences were significant because of the small number of young women in the analyses, but the consistent direction of the group differences suggests that the teenagers living at home were more sexually active than those in foster homes.

The majority of sexually experienced teenagers in both groups had practiced some form of contraception at least once, and the groups were similar in the proportions using each method. There were some differences in the contraceptive practices of the two groups, however. The teenagers in foster care were somewhat less likely to have used a contraceptive at first intercourse and were substantially less likely to have used it at the most recent intercourse (45 percent vs. 64 percent). While 34 percent of the teenagers living at home had obtained contraceptives from a family planning clinic, only 13 percent of those in foster care had done so.

Regression analyses were performed to shed some light on factors predicting early sexual experience in the child welfare population. As one might expect, age was consistently the best predictor of sexual activity. With age and demographic variables controlled, the analyses found that teenagers who lived in households where the rules were perceived to be strict, who had not been sexually abused in any way or who were living in foster homes were significantly less likely to have engaged in voluntary sexual intercourse. Separate analyses of the foster care sample found that even when background variables were controlled, whether the teenager had ever had intercourse voluntarily was strongly and positively related to the number of foster care placements. It is, of course, impossible to know whether multiple placements and lack of sustained guidance from parent surrogates were factors leading to the teenagers' sexual activity or whether sexual activity and other problem behaviors led to termination of foster care placements.

Table 3. Sexual and contraceptive experience among child welfare clients who had ever had intercourse, by residence status

Measure of experience	Foster care (N=37)	At home (N=46)	Difference
Means			
Age at first intercourse	12.6	12.8	–0.2
Number of sexual partners	1.9	3.0	–1.1
Number of times had intercourse in past 3 months	2.3	4.5	–2.2
Percentages			
Had intercourse before 13th birthday	35	22	13
Never had sex voluntarily	19	10	9
Ever used contraceptives	81	83	–2
Ever used oral contraceptives	50	51	–1
Ever used condoms	50	56	–6
Used contraceptive at first intercourse	34	46	–12
Used contraceptive at most recent intercourse	45	64	–19**
Ever obtained contraceptives from a family planning clinic	13	34	–21**

**Difference significant at p<0.05.

Table 4 (page 206) compares the two

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*Age was matched as closely as possible, but our sample, unlike the NSYW, included 13- and 14-year-olds. These young women were matched with young 15-year-olds from the national sample; age was then made a covariate in the subsequent analyses to ensure that it was controlled in developing estimates of group differences.

Table 4. Percentages of teenagers with various sex-related experiences and mean birth control knowledge scores, by study group

Experience and mean score	Foster care teenagers (N=88)	NSYW control group (N=90)	At-home teenagers (N=86)	NSYW control group (N=85)
Ever had intercourse	45.6	29.6**	54.7	35.4**
Ever had voluntary intercourse	37.7	29.6	49.1	35.4*
Ever pregnant	17.6	7.1*	21.0	9.3**
Mean birth control knowledge score	8.2	11.4****	9.6	10.9**

*Difference significant at $p<0.10$. **Difference significant at $p<0.05$.

****Difference significant at $p<0.001$.

Note: The means and percentages shown in Tables 4 and 5 have been adjusted for the teenager's age, ethnicity, parents' education, highest grade of school completed, educational expectations, school status at time of interview, employment status at time of interview, age at menarche, religion and household size.

groups of child welfare teenagers with their NSYW counterparts. The means and percentages were adjusted for age, highest grade completed, educational expectations, household size and other demographic variables often associated with premarital sexual activity. As the data indicate, the child welfare clients—whether in foster care or at home—were over 50 percent more likely than the NSYW teenagers to have had sexual intercourse.

Table 4 also shows the proportions of the two groups that had ever had voluntary sexual intercourse. Because we did not have data on sexual abuse for the NSYW sample, we were forced to assume that all the respondents who had had intercourse had done so voluntarily. If we had had such data for these teenagers, their rates of voluntary intercourse probably would have been lower, thereby resulting in even larger differences between the child welfare and national samples; however, we suspect that the magnitude of the change would have been relatively small. In any event, the difference of eight percentage points between the foster care teenagers and their NSYW counterparts was not significant. The at-home group, however, had a rate of voluntary sexual activity (49 percent) significantly higher than that of the NSYW sample (35 percent).

The pregnancy rates among both the foster care and the at-home teenagers were more than twice those among their matched peers from the national sample once background factors were controlled. About one out of five child welfare teenagers, but fewer than one out of 10 NSYW teenagers, had had a pregnancy.

Finally, the child welfare and NSYW samples were compared with regard to scores on a 20-item scale that measured the respondents' knowledge of various methods of birth control, reproduction and sexually transmitted diseases. The mean adjusted scores of both groups of child welfare clients were significantly lower than those of their matched peers. Teenagers living in foster homes scored especially poorly on the test compared with the teenagers in the national sample.

Further analyses of the child welfare and NSYW samples explored differences among teenagers who were sexually experienced. These analyses revealed that the teenagers living in foster homes had been nearly two years younger at first intercourse than their matched peers (12.4 vs. 14.1); no significant age differences were found between the teenagers who were living at home and their NSYW counterparts once background factors were controlled. Teenagers in foster care were also less likely than the young women in the national comparison sample to have used birth control at their most recent intercourse (44 percent vs. 66 percent). The young women living at home had had more sexual partners (3.4) on average than their matched peers from the national sample (1.7). The two groups were fairly similar in other types of sexual and contraceptive behavior.

Because rates of sexual experience and early pregnancy among adolescents have repeatedly been found to differ by race, we also examined several of the key outcome variables separately for blacks and whites. The adjusted rates are likely to be somewhat unstable because of the small number of teenagers in each cell; therefore, the results should be interpreted cautiously. Table 5 presents the proportions by race of the two groups of child welfare teenagers and their NSYW counterparts who had ever had intercourse, who had ever had voluntary intercourse and who had ever been pregnant.

Among blacks, the foster care and NSYW teenagers were fairly similar on all three outcomes. Among whites, however, there were sizable differences: More than four times as many foster care teenagers as NSYW teenagers had had intercourse by the time of the interview, and almost four times as many had had voluntary sex. The pregnancy rate among the white teenagers in foster care was nearly eight times the rate for those in the matched sample, even when background characteristics were statistically controlled. Furthermore, among the child welfare teenagers, a greater proportion of whites than of blacks had had sexual intercourse. In contrast, among the NSYW sample, black teenagers were much more likely than whites to be sexually experienced.

Interactions between race and child welfare status were also observed among the at-home teenagers and their NSYW matched peers. For all three outcomes, the differences between these child welfare clients and the NSYW teenagers were more substantial among whites than among blacks. For example, among blacks, almost twice as many at-home teenagers as NSYW teenagers had ever been pregnant (24 percent vs. 14 percent), but among whites, the child welfare clients had a risk factor eight times as great as that for their peers from the general population (16 percent vs. two percent). Thus, for every outcome shown in Table 5, white teenagers who were child welfare clients—regardless of whether they had been placed in a foster home—had higher rates than black teenagers from the national sample.

Discussion

Because this study had several methodological shortcomings, its findings should be considered tentative. Nevertheless, many of the findings are consistent with the major hypothesis that young women in the child welfare population are at greater risk of premarital sexual activity and early pregnancy than are other young women from similar social backgrounds. The study also confirms that children who have been sexually abused are at greater risk of early voluntary sexual activity, a factor that presumably accounts for at least some of the elevated risk among the child welfare clients.

An unexpected finding is that young women who remain in their parents' homes despite some family dysfunction are actually more at risk of voluntary sexual activity than teenagers living in foster homes. Although the reasons for the differences between these two child welfare groups in the present study are not totally clear, there are several possible explanations. One is that foster parents actually provide the teenagers in their care with more stable environments. Certainly the foster homes are more likely to have two parents present, a factor that has consistently been found to be associated with lower rates of premarital sexual activity. It is also possible that foster mothers are better role models for adolescents than the at-home teenagers' natural mothers. A recent study found, for example, that mothers in families receiving child welfare services are themselves at high risk of unintended pregnancies.[12]

Table 5. Percentages of teenagers with various sex-related experiences, by race, according to study group

Race and sexual experience	Foster care teenagers	NSYW control group	At-home teenagers	NSYW control group
Blacks	(N=55)	(N=54)	(N=55)	(N=52)
Ever had intercourse	40.2	38.3	55.7	39.7*
Ever had voluntary intercourse	31.1	38.2	50.4	39.7
Ever pregnant	17.2	11.6	24.4	13.8*
Whites	(N=31)	(N=33)	(N=31)	(N=32)
Ever had intercourse	59.2	14.2****	53.1	23.7**
Ever had voluntary intercourse	51.1	14.2***	47.4	23.7*
Ever pregnant	18.2	2.3**	16.4	1.8*

*Difference significant at $p<0.10$. **Difference significant at $p<0.05$.

***Difference significant at $p<0.01$. ****Difference significant at $p<0.001$.

The finding that white teenagers in both child welfare groups are at especially high risk of early sexual activity is difficult to explain. It is possible that this pattern reflects biases in substantiating reported cases of child abuse and neglect. Family dysfunction may have to be much more severe and obvious among white families than among black families for the child welfare agency to take action. If this is true, then white child welfare clients would be expected to have greater behavior problems (including ones relating to sexuality) than black child welfare clients. This interpretation is supported by reported instances of race discrimination within the child welfare system.[13]

The analyses comparing the child welfare clients and the national sample suggest that child welfare teenagers are not only more at risk of premarital intercourse than their peers, but are also less informed about birth control and human sexuality. The foster care teenagers seemed especially needy in this regard. Their scores on the 20-question birth control knowledge test were over three points lower, on average, than those of teenagers in the national comparison group. Foster care teenagers were also significantly less likely than the at-home teenagers to have obtained contraceptives from a family planning clinic. Thus, while foster children may have some "protection" from early sexual activity relative to similar teenagers left in their own homes, those who do become sexually active (and the risk of this is still higher than average) may be at especially high risk of an early pregnancy. The pattern of findings is consistent with our hypothesis that children in foster homes are not only more in need of family planning and sex education services than the average teenager, but are also less likely to obtain them.

This study had several limitations that should be kept in mind. First, our sample was a volunteer sample from metropolitan areas within a single state. Second, the sample was a fairly small one. Third, the rate of response to our recruitment efforts was relatively low. And finally, the national comparison sample differed from the child welfare sample in several important characteristics, and the data from it were collected seven years earlier than the data from the child welfare sample.

Nevertheless, this was the first study that gathered data on the sexual activity of a nonclinical sample of the child welfare population. It would be virtually impossible to obtain similar information from a national sample of child welfare clients, and even obtaining such data from a multistate sample would be difficult. Unlike many other studies that have focused on children in foster care, this study had a comparison group made up of adolescents from similar socioeconomic backgrounds.

For several reasons, most of the biases alluded to above would be likely to yield conservative estimates of sexual activity and pregnancy in the child welfare population. First, the state in which the data were gathered has a rate of out-of-wedlock childbearing somewhat below the national norm. Second, the analysis of response bias suggests that, as a group, the nonrespondents were probably even more disadvantaged than the respondents. For example, the rate of reported sexual abuse was lower among those who participated in the study than among those who declined, suggesting that the rates of sexual activity among the child welfare teenagers were actually underestimated in this study. Third, the comparisons between the child welfare teenagers and the national comparison sample may have been biased because the child welfare clients were younger. Although age was statistically controlled in the analyses, it is likely that not all the variation associated with age—which was the single best predictor of whether or not the teenager was sexually experienced—was removed.

The only bias that could have gone in the opposite direction stems from the seven-year gap between collection of the NSYW data and collection of the child welfare data. If the rates of sexual activity among adolescents in general increased over this period, the elevated rates among the child welfare teenagers could reflect a general population trend. However, analyses of data from various national surveys suggest that the rate of early sexual activity among teenagers peaked in the late 1970s, remained fairly constant through the early 1980s, and may even have declined in the last few years.[14]

Thus, we believe that, on balance, this study provides compelling evidence that child welfare clients constitute a high-risk group of teenagers who merit special attention among family planning and child welfare policymakers and service providers. Other data from this same study indicate that state child welfare agencies have generally not met the needs children in their care have for sex education and family planning services, and that foster care caseworkers often do not discuss sexuality and birth control with their clients.[15] The issue of teenage pregnancy ought to be one of particular concern to child welfare agencies, not only because of the sexual vulnerability of their clients, but also because the young people in the child welfare system are at very high risk of becoming the neglectful and abusing parents of the next generation. This is especially likely to be the case if they give birth during their teenage years. Helping them to become productive, independent adults whose childbearing is planned should be a major goal of child welfare agencies.

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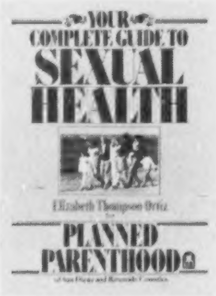

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Female Sterilizations in the United States, 1987

By Dana Belmonte Schwartz, Phyllis A. Wingo, Libby Antarsh and Jack C. Smith

Summary
A study by the Association for Voluntary Surgical Contraception and the Centers for Disease Control estimated that 640,000 tubal sterilizations were performed in the United States during 1987. The majority of these were inpatient procedures (66 percent) performed in civilian or military hospitals. Hospitals were also the site for the largest share of the 215,000 outpatient procedures. Overall, 33 percent of sterilizations were laparoscopies: 10 percent of the inpatient sterilizations and 79 percent of outpatient procedures. The region with the largest number of sterilizations was the South, which also had the smallest proportion done on an outpatient basis.

Only about 10 percent of inpatient sterilizations were laparoscopies, compared with 79 percent of outpatient procedures, whether these were performed in outpatient hospital units, in freestanding surgical centers or in family planning clinics.

Introduction

The 1982 National Survey of Family Growth has shown that sterilization is the most widely used contraceptive method in the United States.[1] That year, sterilizations accounted for 33 percent of all contraceptive practice among women aged 15–44; 22 percent of all women using birth control said that they had undergone tubal sterilization, and an additional 11 percent of women reported that their partners had undergone vasectomy.[2]

The number of female sterilizations performed, the types of procedures surgeons use, the settings in which they are performed and the geographic locations are information that is important to program managers, policy planners, public health officials, medical entrepreneurs, health economists and other professionals concerned with the patterns, quality and cost of health care. These data can also contribute to the general knowledge of contraceptive practice and provide a potential framework for the interpretation of trends about the use of other contraceptive methods. For example, as other methods become available (e.g., the contraceptive sponge and the cervical cap) or are removed from the marketplace (e.g., the intrauterine device), or as policy alters the reproductive choices available to women (e.g., the U.S. Supreme Court restrictions on *Roe* v. *Wade*), information about sterilization procedures performed in the United States could provide an indicator of the impact of these events on contraceptive practice.

The self-reported, widespread use of sterilization by women (and by their partners) has engendered several studies designed to estimate the number of these procedures performed annually in the United States. Some studies have estimated the total number of procedures performed nationally, whereas others have focused on sterilizations performed in specific types of medical facilities.[3] Several studies have described the demographic characteristics of patients who are sterilized; others have evaluated procedure types, cost and geographic availability.[4] Methods used to collect sterilization data have included surveys of physicians who perform the operation and surveys of administrators of the medical facilities where sterilizations are performed.[5] Also, governmental and nongovernmental health, market research and hospital organizations have conducted secondary analyses of sterilization data routinely collected as part of more comprehensive surveys.[6]

No national reporting system exists to count sterilizations performed annually in the United States, but the Centers for Disease Control (CDC), the Association for Voluntary Surgical Contraception (AVSC) and The Alan Guttmacher Institute have attempted (both individually and collaboratively) to provide total or partial enumerations and estimates at various times throughout the past two decades.[7] Although the estimates produced through varying data sources, methods and analyses have differed, each study has contributed to the general knowledge of sterilization, and much has been learned about ways to report sterilization incidence and to produce more accurate national estimates of the procedures performed. This article, another step in the ongoing refinement of this process, reports on female sterilizations performed in the United States in 1987.

Methodology

The AVSC and the Division of Reproductive Health, Center for Chronic Disease Prevention and Health Promotion at the CDC collaborated to estimate the total number of female sterilizations performed in the United States in 1987 and to describe differences in numbers of female sterilizations by geographic location, type of facility (inpatient or outpatient) and type of procedure (laparoscopic or nonlaparoscopic). Data from five types of facilities were combined: Family planning clinics, outpatient hospital surgical units and free-

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Table 1. Number and percentage of tubal sterilizations, by type of facility and geographic region, United States, 1987

Type of facility	All	North-east	North Central	South	West
NUMBER					
Total	**639,800**	**95,800**	**153,500**	**247,000**	**143,500**
Inpatient	424,400	63,400	83,000	187,000	91,000
Hospital surgical units	414,000	63,000	82,000	181,000	88,000
Military hospitals	10,400	400	1,000	6,000	3,000
Outpatient	215,400	32,400	70,500	60,000	52,500
Hospital surgical units[*]	172,000	28,000	60,000	44,000	40,000
Freestanding centers	41,000	4,000	10,000	15,000	12,000
Family planning clinics	2,400	400	500	1,000	500
PERCENT					
Total	**100.0**	**15.0**	**24.0**	**38.6**	**22.4**
Inpatient	66.3	66.2	54.1	75.7	63.4
Hospital surgical units	64.7	65.8	53.4	73.3	61.3
Military hospitals	1.6	0.4	0.7	2.4	2.1
Outpatient	33.7	33.8	45.9	24.3	36.6
Hospital surgical units	26.9	29.2	39.1	17.8	27.9
Freestanding centers	6.4	4.2	6.5	6.1	8.4
Familly planning clinics	0.4	0.4	0.3	0.4	0.3

[*]Standard error by region: **Northeast**—3,800 based on data from 62 hospitals; **North Central**—6,700 based on data from 106 hospitals; **South**—4,200 based on data from 104 hospitals; and **West**—6,000 based on data from 62 hospitals.

standing surgery centers were categorized as outpatient facilities; inpatient hospital surgical units and military medical centers were categorized as inpatient facilities.[*]

The AVSC has tracked sterilization services in family planning clinics since 1971. Both Planned Parenthood affiliates and independent family planning centers are monitored; the latter includes state, city and town health departments as well as other independent clinics. The list of facilities performing sterilizations (both tubal sterilizations and vasectomies) is updated annually. Using the 1987 list, the AVSC administered two mail surveys from April through September 1987 to the 96 family planning clinics in the United States known to perform sterilizations. All the clinics responded, and 34 reported that they performed tubal sterilizations.[†] Each reported the number of procedures and whether or not the sterilization was performed by laparoscopy.

A survey of hospitals in the American Hospital Association (AHA) that provide outpatient female sterilizations on-site was also fielded. The 1986 AHA Annual Survey of Hospitals had included a question that made it possible to identify the 1,385 facilities that provide sterilization services for women.

Two variables had been previously identified as helpful in predicting the number of sterilizations performed in hospital outpatient surgical units—U.S. census region and number of outpatient surgical procedures performed.[8] The listing of 1,385 eligible hospital surgical units was stratified according to census region (Northeast, North Central, South and West) and the total number of outpatient surgical procedures performed in the facility during 1987 (fewer than 500, 500–2,499 or more than 2,499 procedures). The overall sample size required to attain a significance level of 0.05 was estimated to be 384.

In a survey conducted in 1984, the overall response rate for outpatient surgical units was 28 percent, and outpatient surgical units that performed the most procedures had the highest response rates.[9] The response rates for the 1987 survey were arbitrarily anticipated to be higher: 40 percent for the three categories of facilities where fewer than 500 procedures were performed, 50 percent for those facilities where from 500 to 2,499 procedures were performed and 60 percent for those facilities where 2,500 procedures or more were performed. Inflating the estimate of 384 for this expected response distribution yields a sample size of 775. However, from logistical and financial perspectives, the maximum sample size feasible was 600.

A simple random sample of facilities with proportional allocation of the sample sizes within each stratum resulted in the selection of 603 hospital outpatient surgical units to be surveyed. After three mailings (a certified letter to the hospital's chief administrator followed by two reminder letters) and as many as four follow-up telephone calls, 428 hospitals (71 percent) responded. There were no significant differences between those sites that responded and those that did not by geographic location and total number of outpatient procedures performed. Among the responding hospitals, 72 indicated that no tubal sterilizations were performed in their hospital during 1987. Of the 356 indicating that female sterilizations were performed during 1987, 22 were unable to provide the number of procedures performed. Consequently, data from 334 hospitals were used to estimate the number of tubal sterilizations performed in hospital outpatient surgical units during 1987. (Standard estimation procedures for stratified simple random samples were used to compute the total number of tubal sterilizations performed in hospital outpatient surgical units;[10] standard errors were estimated using SESUDAAN.[11])

Sources for identifying freestanding surgery centers[‡] were the membership roster of the Federated Ambulatory Surgery Association (a list maintained and annually updated by the AVSC) and a listing compiled by the SMG Marketing Group, Inc., a market research organization that provides information to the health care industry. Cross-referencing the lists indicated that SMG had identified the majority of the freestanding surgery centers. Those not on its list were added, and data on female sterilizations performed at freestanding surgery centers were sought during a 1987 SMG survey of all centers. Several questions to determine whether the facility performed tubal sterilizations, the number done and the procedures used were added to a standard questionnaire.

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[*] In this study, an outpatient facility is defined as one in which physicians perform ambulatory surgery, without requiring an overnight stay by the patient. Conversely, an inpatient facility requires the patient to remain overnight after surgery is performed. Although some of the same institutions may be included in both the inpatient and outpatient hospital samples, the two types of surgical units are considered to be separate and distinctly different from one another. The authors are confident that the hospital data reported in this study reflect no overlap or "double counting" that might result from hospitals using differing definitions of inpatient and outpatient.

[†] The family planning clinic survey also asked for the number of vasectomies performed in 1987; that data is not included in this article.

[‡] In this study, a freestanding surgery center is defined as a health care facility whose primary purpose is to provide a place for patients who do not require an overnight stay to undergo surgical procedures, not simply medical consultations. Such a facility must have two or more physicians performing ambulatory surgery and one or more backup hospitals, but not be the outpatient surgical unit of a hospital.

Of the 881 freestanding surgery centers surveyed, 285 were excluded from the analysis because they performed specialized services such as podiatry or eye surgery. An additional 16 were excluded because they were already represented in the AVSC clinic survey. Ninety-one percent of the remaining 580 facilities responded to the question asking whether or not female sterilizations were performed at the facility. Of the 398 that indicated that they did perform such procedures, 288 (72 percent) reported the number of tubal sterilizations and the number performed by laparoscopy. Estimates of the total number of female sterilizations performed in freestanding surgery centers are based on data provided by the reporting facilities.

The National Hospital Discharge Survey, an annual probability sample of short-stay nonfederal hospitals conducted by the National Center for Health Statistics, was the primary source for the data about hospital inpatient female sterilizations. For 1987, medical records for approximately 181,000 patients discharged from approximately 400 hospitals were abstracted.[12] In our analysis, we include the survey estimates of laparoscopic versus nonlaparoscopic procedures.

Using worldwide reporting networks, the three branches of the United States Armed Forces (the Army, Navy and Air Force) recorded the number of female sterilizations performed at military facilities during 1987. AVSC requested the data categorized by geographic area, inpatient or outpatient status and type of procedure. Data reported in 1984 did not include information about these characteristics;[13] in addition, the 1987 estimates are not directly comparable to those for 1984 because sterilizations performed in military facilities outside the United States were excluded from the 1987 figures.Thus, the number of female sterilizations reported in this study is the number estimated by the branches of the Armed Forces, although Army sources noted that inpatient female sterilizations may be underreported.

Findings

As Table 1 shows, an estimated 640,000 tubal sterilizations were performed in the United States in 1987, most (66 percent) in inpatient hospital settings. Of the 215,000 female sterilizations performed as outpatient procedures, the majority were performed in hospital settings also. Freestanding surgical centers and family planning clinics together provided only about seven percent of all procedures.

The most sterilizations were performed in the South (39 percent of all procedures), and the fewest were performed in the Northeast (15 percent). This was true also for inpatient procedures. However, the North Central region had the largest number and proportion of procedures done in an outpatient setting (70,500, or 46 percent of sterilizations done in that region) and the South had the smallest proportion (24 percent). Family planning clinics supplied about the same proportion of procedures in each region, but freestanding surgical centers provided twice the proportion in the West as in the Northeast.

Of all sterilizations performed, 212,000, or one-third, were laparoscopic procedures, as Table 2 shows. Only about 10 percent of sterilizations performed in inpatient settings were laparoscopic. The majority of sterilizations that were performed in outpatient settings, however, whether in outpatient hospital units, freestanding surgical centers or family planning clinics, were laparoscopies (79 percent).

In the Northeastern, North Central and Western regions, the proportion of laparoscopies was fairly consistent, at about 35–39 percent of all sterilizations. Although the largest number of laparoscopies were performed in the South, that region had the smallest proportion, only 27 percent.

Discussion

Overall, the number of women choosing to undergo tubal sterilization appears to have decreased in recent years. In 1984, AVSC estimated that 731,000 procedures were performed.[14] If the decrease is real, there are a couple of possible reasons. One, the 1958–1962 baby-boom population, now approaching its 30s, tends to marry later and delay childbearing; this may, in turn, delay the decision to seek sterilization. Two, possibly so many women have already chosen sterilization that there are fewer women in the relevant age cohorts left unsterilized. More definitive interpretations of what the numbers mean in relation to the demographics of age and delayed childbearing will best await results from the 1988 National Survey of Family Growth.

The majority of inpatient tubal sterilizations were done by surgical approaches other than laparoscopy. Most likely, these procedures were performed postpartum or for medically indicated reasons. The larger proportion of nonlaparoscopic procedures reported for the South is related to the large number of inpatient sterilizations performed in the South and, to a lesser degree, in the military facilities in that region. Conversely, the majority of laparoscopic procedures were performed in outpatient settings. Women who obtain sterilizations that are not postpartum are probably more likely to undergo surgery in outpatient facilities.

Table 2. Number of laparoscopic procedures and percentage of procedures that are laparoscopic, by type of facility and region

Type of facility and region	Number	Percent
All facilities	**212,000**	**33.1**
Inpatient	42,000	9.9
Hospital surgical units	39,000	9.4
Military hospitals	3,000	30.0
Outpatient	170,100	79.0
Hospital surgical units*	131,000	76.2
Freestanding centers	37,000	90.2
Family planning clinics	2,100	87.5
All regions	**212,000**	**33.1**
Northeast	34,000	35.4
North Central	56,000	36.4
South	66,000	26.7
West	56,000	38.9

*Standard error: 9,400 procedures based on data from 328 hospitals.

Note: Numbers do not always add to total because of rounding.

Although direct comparisons are difficult, the 1987 estimates of female sterilizations are probably more reliable than the 1984 estimates. First, the response rate is substantially higher for the outpatient components of the estimate (among outpatient surgical units, 71 percent in 1987 vs. 29 percent in 1984[15]). Second, ongoing efforts to maintain an updated inventory of ambulatory facilities have created greater confidence in the identification of the universe to be sampled. Coding changes in the American Hospital Association membership list, for example, made possible the ready identification of hospitals performing sterilizations in outpatient settings, and AVSC prepared a substantially larger master list of freestanding surgical centers for 1987 than in 1984. On the other hand, the number of female sterilizations performed in military facilities may have been slightly undercounted. However, because fewer than two percent of female sterilizations were performed in military facilities, the overall estimate is unlikely to be materially affected.

Because of refinements in the data collection process, only some estimates can be directly compared with data from the 1984 survey. One comparable component is the inpatient hospital data from the National Hospital Discharge Survey. The number of female sterilizations performed at inpatient hospital settings decreased from 488,000 in 1984[16] to 415,000 in 1987. The decrease likely reflects part of a continuing trend toward outpatient services and the movement toward ambulatory surgical services. According to reports from the SMG Marketing Group, the number of hospital outpatient procedures has grown at double-digit rates since 1984, and the number of inpatient surgical procedures is expected to drop one percent per year through 1991.[17]

Another comparable component of the data derives from Planned Parenthood affiliates, which provide a subset of the family planning clinic survey data. Although approximately the same number of Planned Parenthood affiliates provided female sterilization in 1987 as in 1984, the total number of female sterilizations decreased by nearly 15 percent (from 1,241 to 1,057). A supplemental telephone survey of the Planned Parenthood clinics reporting tubal sterilizations in the 1987 survey indicated a variety of reasons for the decreased number of procedures performed, including decreases in public funding from the state and federal levels and competition from the private sector.

Freestanding surgery centers appear to be the only setting in which the number of female sterilizations has increased. The data indicate that 4.8 percent of all female sterilizations were performed in freestanding surgery centers in 1984,[18] compared with 6.4 percent in 1987, although the AVSC 1984 and 1987 data are not directly comparable because of the more complete identification of freestanding surgical centers in 1987. However, the number of such centers has increased markedly: The SMG Marketing Group identified 330 freestanding surgery centers in 1984,[19] and our researchers identified 881 in 1987. In addition, the number of surgical procedures of all types performed at such centers increased approximately 40 percent during 1986 and 1987.[20] Undoubtedly, many sterilizations that previously would have been performed in inpatient hospital settings or in the outpatient clinic of the hospital are now being performed in freestanding surgery centers.

Currently, no national data are collected annually on surgical procedures performed in outpatient hospital units and for-profit freestanding surgery centers. Previous studies by the CDC of numbers and characteristics of female sterilizations were based on hospital records from the Hospital Discharge Survey; these studies ended when it became clear that in-hospital sterilizations were not representative of all sterilizations.

In view of the finding that one-third of all female sterilizations now take place in outpatient settings, future studies of female sterilization need to consider both inpatient and outpatient sites. The National Center for Health Statistics has recognized the necessity of collecting outpatient data to acquire a more complete overview of American surgical practices, and it plans to supplement the Hospital Discharge Survey by adding outpatient departments and freestanding surgery centers. That effort is now under way, and perhaps a national source for female sterilization data will soon exist to provide a clear sense of the characteristics and trends in female sterilizations in the United States. In the interim, periodic studies continue to be needed for tracking shifts in both setting and methods of performing female sterilizations, as well as for estimating the total number of procedures.

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AIDS Knowledge, Perceived Risk And Prevention Among Adolescent Clients Of a Family Planning Clinic

By Carol S. Weisman, Constance A. Nathanson, Margaret Ensminger, Martha A. Teitelbaum, J. Courtland Robinson and Stacey Plichta

Summary

In a survey that measured AIDS knowledge, perceived risk and prevention among 404 sexually active adolescent women who were family planning clinic patients in Baltimore, knowledge about AIDS was high, with the average respondent answering seven out of nine questions correctly. Slightly more than half of the teenagers reported some degree of perceived risk that they could get AIDS. However, perceived AIDS risk was not predictive of condom use at last intercourse. The strongest predictor of condom use was having asked a partner to use one, suggesting that adolescent women may exert a greater influence on condom use than has been previously assumed. The analyses result in recommendations that personalized AIDS prevention programs be integrated into family planning programs, that adolescent clients be advised to use condoms with spermicides, and that they be assisted in acquiring the social skills needed to negotiate condom use with partners.

Introduction

Inner-city adolescents are thought to be at high risk for infection with the human immunodeficiency virus (HIV) because this population is likely to be exposed to early initiation of sexual activity, multiple sex partners, other sexually transmitted diseases (STDs) and experimentation with substance use. Currently, only about one percent of the diagnosed AIDS cases in the United States are among adolescents: The Centers for Disease Control report that as of May 1988 there were 705 cases of AIDS among 13–21-year-olds.[1] Despite the relatively low prevalence of AIDS among teenagers, adolescent exposure to HIV requires the attention of family planning providers for several important reasons. First, AIDS prevalence data may underestimate the rate of HIV infection during adolescence. Persons exposed to the virus in their teens may not show symptoms until their 20s, owing to an incubation period that could be as long as 10 years.[2] Second, the incidence of other STDs among adolescents is cause for concern. Among sexually experienced women, age-specific rates of infectious syphilis, gonorrhea and pelvic inflammatory disease are highest for adolescents and decline exponentially with increasing age.[3] Furthermore, syphilis has been shown to be associated with HIV infection, and its incidence is increasing among young heterosexuals.[4] Rates of STDs other than AIDS reflect the types of risk-taking behavior (such as sex with multiple partners) that are also associated with HIV transmission. In addition, STDs resulting in genital ulcerations may increase susceptibility to HIV infection.[5]

Third, the concept of cumulative risk is important when considering adolescents. While the risk of acquiring HIV from any one sexual partner is quite low, the cumulative risk from exposure to multiple partners increases rapidly as the number of partners increases. The earlier in life that sexual activity is initiated, the greater the number of sexual partners the individual is likely to have. Thus, adolescence is a critical period in which to intervene to promote protective behavior—for example, postponing the initiation of sexual activity and, for those who have already started to have sexual relationships, increasing the average duration and monogamous character of relationships.

Finally, heterosexual transmission appears to account for a larger proportion of HIV infection among adolescent women than among adolescent men. For example, a 1987 study of over 4,000 predominantly black patients attending STD clinics of the Baltimore City Health Department found HIV seroprevalence rates of 2.5 percent among 15–19-year-old women and 2.0 percent among men in the same age-group.[6] Since fewer women than men acknowledged engaging in such high-risk behavior as intravenous drug use, the gender difference in seropositivity is thought to reflect the tendency of young women to have sexual intercourse with older men; these men have had longer exposure periods and are also more likely to be intravenous drug users.[7]

The risks to adolescent women and the potential for perinatal transmission of HIV by adolescent mothers highlight the need to develop effective interventions to promote protective behavior. For sexually active adolescents, family planning clinics are logical settings for such intervention. Nationally, about half of the adolescent women who practice contraception obtain their method from organized family planning providers rather than from private physicians.[8] Among these adolescents, 40 percent use public health departments, 28 percent attend Planned Parenthood clinics, 11 percent go to hospital-based clinics and 21 percent use other types of agencies.[9] Organized providers are also known to serve primarily nonwhite and low-income adolescents.[10] For some of these adolescents, family planning sites are the predominant source of health care and may be the only potential source for preventive services as well.

The individual's perceived susceptibility—or perceived personal risk of a disease—is considered to be an important determinant of taking preventive action.[11] Little is known, however, about how sexu-

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Table 1. Percentage of adolescent women attending a family planning clinic in Baltimore who gave the correct response to true-false statements concerning AIDS, 1988 (N=404)

Statement (correct response)	%
People who use drugs can get AIDS by sharing needles. (True)	99.8
If a pregnant woman has AIDS, her baby can get AIDS. (True)	97.0
Using birth control pills can reduce the chances of getting AIDS. (False)	93.6
AIDS can be cured. (False)	92.8
A woman is more likely to get AIDS if her male sex partner has had homosexual sex. (True)	90.1
Always using a condom can reduce the chances of getting AIDS. (True)	89.1
You can get AIDS by drinking from the same cup or glass as a person who has AIDS. (False)	77.0
All people who have the HIV virus have AIDS. (False)	71.5
Using a spermicide can reduce the chances of getting AIDS. (True)	30.4

ally active teenagers perceive their risk of AIDS or the extent to which perceived risk results in preventive behavior, such as condom use. A recent study of sexually active male and female adolescents in San Francisco found that although subjects believed condoms were effective in preventing STDs, these perceptions did not result in increased use of condoms;[12] the study did not, however, measure the adolescents' perceived risk of getting AIDS.

The Study

To assess the potential for integrating AIDS prevention with family planning, we explored the relationships among knowledge about AIDS, perceived personal risk and preventive behavior among sexually active adolescent women who had come to a clinic for family planning services. The data come from baseline results of an ongoing prospective study of contraceptive decision-making. Baseline interviews were conducted with 430 women aged 11–18 who obtained oral contraceptives at a Planned Parenthood clinic in Baltimore.

Compared with other cities, Baltimore has not only high rates of adolescent pregnancy[13] but also high rates of STDs, particularly gonorrhea and syphilis.[14] Furthermore, in a recent study of women attending a Baltimore STD clinic, the highest rates of gonorrhea and chlamydia were found in clients under age 20.[15] As for HIV infection, among military recruits screened in 1985–1986, the seroprevalence rate among Baltimore residents was more than five times the national average (8.3, compared with 1.5 per 1,000 recruits screened).[16] In a recent study of 184 intravenous drug abusers in Baltimore, 29 percent tested positive for HIV.[17] Thus, the young women in this study are regarded to be at high risk for HIV infection.

Each study participant made a family planning clinic visit during 1988 and met the following eligibility criteria: age 18 or younger, unmarried and not pregnant. In addition, each was receiving a prescription for oral contraceptives for the first time or, if a previous user, was initiating a new episode of use after a hiatus of at least three months. Eligibility was limited to oral contraceptive users since this method is prescribed for nearly all of the clinic's adolescent clients. About 50 percent of the eligible subjects were postabortion patients, 62 percent had ever been pregnant and 43 percent reported some prior use of the pill.

At the time of the study, the clinic provided basic AIDS information but did not have a formal program of HIV-antibody testing or of AIDS prevention services. The clinic's interest in this study, in part, stemmed from a need for baseline information on AIDS knowledge and risk factors among the adolescent clients. Participants were interviewed by professional interviewers (not clinic personnel) for about 40 minutes immediately after their family planning visit and were paid $10.

The 430 subjects represent a participation rate of 72 percent among eligible patients during a 12-month enrollment period. The major reason for refusal to participate was the inability to spend more time in the clinic (where an initial visit takes several hours). The participation rate for blacks was higher than that for whites—78 percent and 54 percent, respectively. There were no substantial differences in participation rates by age or reason for the clinic visit, however.

Since our study was restricted to those adolescents whose sexual experience places them at potential risk for heterosexual transmission of HIV, we excluded the 26 subjects who reported that they had not yet initiated sexual activity. Therefore, the final sample size was 404 sexually active adolescent women. Ninety percent of these adolescents resided in Baltimore City, and 81 percent were black. The study participants ranged in age from 11 to 18, with a mean age of 16. The average participant had completed 10 years of school, and most were in school or had already graduated; only seven percent were dropouts. However, 23 percent had mothers who were not high school graduates. The majority of those surveyed (62 percent) were Protestant, 20 percent claimed no religion, 16 percent said they were Catholic and two percent reported other religions.

Results

All the subjects reported that they had heard about AIDS or the AIDS virus. In response to the question "Where did you first hear about AIDS?," subjects were permitted to name more than one source, and 42 percent did so. Television was most frequently named as the first source of information, followed by the classroom (schools are required to teach about AIDS in Maryland), the press and parents. (Adults surveyed in the 1988 National Health Interview Survey also mentioned TV as their major source of AIDS information.[18]) Only nine percent of subjects in our study reported hearing about AIDS for the first time from a health care provider. In addition, 14 percent said that they personally know someone who has AIDS.

We measured knowledge regarding the causes, transmission and prevention of AIDS using nine true or false statements, several of which were adapted from the work of Ralph DiClemente and colleagues.[19] Table 1 shows the statements and their responses, which have been ranked in order from highest rate of correct response to the lowest. Overall, knowledge levels are high compared with the DiClemente 1985 findings among high school blacks in San Francisco. On five items, at least 90 percent of the study participants knew the correct answer; two of these items contain information particularly relevant to family planning (i.e., knowing that a pregnant woman can transmit AIDS to her baby and knowing that oral contraceptives provide no protection against AIDS). Eighty-nine percent of the subjects knew that condoms provide protection, but only 30 percent knew that spermicides can also provide protection. On average, subjects gave correct answers to seven out of nine items, and the median number of correct responses was eight. The number of correct responses was not associated with age, race or knowing someone with AIDS.

Perceived personal risk of AIDS was measured by asking the young women, "How much chance do you think there is that you will get AIDS in the next five years?" The interviewer then read the following response options, which were also listed on a card handed to the subject: "Very sure it will not happen; somewhat sure it will not happen; there is an even chance (50–50); somewhat sure it will happen; or very sure it will happen." (Our question refers to getting AIDS, rather than to testing positive for the AIDS virus, because we anticipated that most of our subjects would be unable to distinguish between having HIV antibodies and having AIDS.)

Nearly half of the adolescents (47 percent) reported that they were very sure they would not get AIDS in the next five years. The remaining teenagers reported some degree of perceived risk: Thirty percent reported being somewhat sure they would not get AIDS; 21 percent said they had an even chance; and one percent reported being somewhat sure they would get AIDS, although no one reported that she was very sure she would get AIDS. Among participants in the 1988 National Survey of Adolescent Males, 26.6 percent indicated that they had no chance of getting the AIDS virus in the next five years.[20]

Due to the distribution of responses and the possibility that some subjects might have expressed any degree of uncertainty as an "even chance," we dichotomized the responses for purposes of analysis, contrasting subjects who perceived any degree of risk of AIDS with those who perceived none. We found that the perception of any personal risk is not associated with age, race, knowing someone with AIDS or AIDS knowledge level.

To determine whether perceived personal risk is associated with risk-taking behavior, we analyzed reported patterns of sexual behavior and substance use. The average study subject had initiated sexual activity at age 14.4 and had had a total of 2.8 male sexual partners. The number of partners ranged from one to 20; 66 percent of subjects had had more than one male partner. The partners tended to be sequential rather than concurrent and on average, the adolescent women had had 1.7 partners per year of sexual activity.

As discussed earlier, we consider having sexual intercourse with older men to be a risk factor for infection with HIV. Eight percent of the subjects reported having a current male sex partner more than five years older than they were. Since these particular adolescents were an average of 16.6 years old, their partners would have been, on average, 21 or older. In addition, 11 percent of our sample indicated that a doctor had told them at some point that they had an STD. Finally, 62 percent had had at least one pregnancy.

In this study, we did not ask whether subjects had engaged in anal intercourse or sexual relations with bisexual men, or had exchanged sex for money or drugs. Although these are all risk factors for HIV acquisition, our preliminary clinic studies showed that female adolescents in Baltimore rarely report these practices.

In response to questions about their use of cigarettes, alcohol and other drugs, nearly half the subjects (48 percent) reported having used none during the past year; these subjects tended to be under age 17. Beer and wine were consumed by the largest proportion of subjects (42 percent), followed by cigarettes (28 percent), hard liquor (17 percent), marijuana (16 percent) and other illicit drugs (four percent). No one reported intravenous drug use.

For our purposes, we considered use of marijuana or other illicit drugs as a marker for potential intravenous drug use or for sexual relations with an intravenous drug user. Our rationale is based on a study of longitudinal data showing that smoking marijuana as a teenager increases the risk of later initiating use of other illicit drugs: Among women who initiate marijuana use before age 19, 27 percent will start using other illicit drugs by age 25. Furthermore, the probability of taking other illicit drugs is strongly reduced when marijuana use is initiated after age 19.[21]

As in other studies of substance use by adolescents, ours also found that blacks are less likely than whites to report illicit drug use: Thirty-one percent of whites and 13 percent of blacks reported use of marijuana or other illicit drugs in the past year. Results from the 1984 National Longitudinal Survey of Youth show that blacks tend to underreport drug use, although it is not clear why or by how much.[22]

All our risk-taking variables (number of male sex partners, currently having an older partner, having had an STD, ever having been pregnant and having used marijuana or other illicit drugs) are positively and significantly intercorrelated. The strongest positive correlation is between the number of male sex partners and the use of marijuana or other illicit drugs (Pearson's $r=+0.27$, $p<0.0001$). This association suggests that some young women may be having sexual relations in conjunction with drug use or in exchange for drugs or money.

We performed a multiple logistic regression analysis to examine the effects of AIDS knowledge, risk-taking behavior and age and race on the perceived personal risk of AIDS. The results of this analysis appear in Table 2. Only the total number of male sex partners significantly increases the odds of perceiving some degree of AIDS risk. For each additional partner after the first one (since all subjects in our study have had at least one partner), the odds that a subject perceives any AIDS risk increases by a factor of 1.11. None of the other risk-taking behaviors, nor the level of knowledge, predicts perceived risk. Age and race, included as control variables, also were shown to have no significant impact on perceived risk.

Table 2. Multiple logistic regression analysis of predictors of any perceived risk of AIDS

Predictor	Regression coefficient	Standard error	Change in odds†
AIDS knowledge: sum of correct responses§	0.15	0.10	1.16
Total number of male partners§	0.11	0.05	1.11**
A current partner >5 years older‡	0.56	0.43	1.75
Ever had STD‡	0.41	0.34	1.51
Ever pregnant‡	–0.08	0.22	0.92
Used illicit drugs in past year‡	0.50	0.31	1.64
Age at interview	0.03	0.07	1.03
Black‡	–0.03	0.27	0.97
Intercept	–1.86	1.35	na

**$p<0.05$.

†For this and the following table, the antilog of the regression coefficient shows the expected change in the odds of the outcome corresponding to a unit change in the predictor; for a dichotomous predictor, such as race, this is equivalent to the relative odds.

§Continuous variable.

‡Dichotomous variable coded 1 if yes, 0 if no.

Notes: na=not applicable. Model Chi Square=21.50 with 8 degrees of freedom ($p=0.006$). In this and the following table, N=402 as two women were excluded from analysis because of missing data.

We next attempted to determine whether perceived personal risk of AIDS is related to preventive behavior. Since the focus of the original project was contraceptive decision-making, we measured two preventive actions related to condom use. Subjects were asked whether awareness of AIDS had ever motivated them to ask a partner to use a condom; 49 percent reported that it had. Subjects were also asked which contraceptive method, if any, they had used at last sexual intercourse. (For 61 percent of subjects, last intercourse occurred within three weeks of the baseline interview.) Thirty-eight percent of the women said that they had used a condom. Blacks were significantly more likely than whites to report having asked a partner to use a condom, but the relationship between race and having used a condom at last intercourse was not statistically significant.

Because of differences in samples and questions asked in studies of adolescents, it is difficult to assess how the rate of condom use at last intercourse reported in our study compares with others. In a recent telephone survey in Massachusetts, for example, 37 percent of sexually active 16–19-year-olds (males and females) reported that they never use condoms while 33 percent claimed that they use them "only some of the time."[23] Furthermore, in the 1988 National Survey of Adolescent Males, 66 percent of never married, sexually active 15–19-year-old black males reported that they had used a condom at last intercourse.[24] Given the high levels of awareness of the AIDS epidemic, recent reports of condom use may be inflated by respondents who give the socially desirable answer.

We used multiple logistic regression analysis to examine predictors of condom use at last intercourse; the results are presented in Table 3. The strongest predictor of condom use at last intercourse is having asked a partner to use one, which increases the odds of use by a factor of 2.66. Knowledge of the efficacy of condoms has a marginal (p=0.09) positive effect on condom use, while perceived risk of AIDS has no statistically significant effect on use. Having an older sex partner, ever having been pregnant and using illicit drugs reduce the odds of condom use at last intercourse. Finally, age and race have no significant effects on condom use at last intercourse.

Discussion

The results of our analyses have some important implications for family planning providers. First, providers need to recognize that sexually active adolescents are aware of AIDS and tend to have high levels of general knowledge about its causes, transmission and prevention. Furthermore, adolescents most likely acquired much of this knowledge prior to their initial visit to a family planning provider. Among surveys conducted with students in grades 9–12 in six cities and nine states across the country, the percentage knowing that AIDS is transmitted through sexual intercourse ranged from 88 percent to 98 percent, and the percentage knowing that AIDS is transmitted by sharing needles ranged from 84 percent to 98 percent.[25] Thus, the adolescents in our clinic-based sample apparently exhibit high levels of knowledge compared with a school-based population of adolescents, some of whom are not sexually active.

Table 3. Multiple logistic regression analysis of predictors of condom use at last intercourse

Predictor	Regression coefficient	Standard error	Change in odds
Ever asked partner to use condom‡	0.98	0.23	2.66**
Knows condom use reduces AIDS risk‡	0.64	0.38	1.90*
Perceives a risk of AIDS‡	–0.17	0.23	0.85
Total number of male partners§	0.05	0.05	1.05
A current partner >5 years older‡	–1.16	0.54	0.31**
Ever had STD‡	0.38	0.36	1.46
Ever pregnant‡	–1.13	0.24	0.32**
Used illicit drugs in past year‡	–0.63	0.34	0.53*
Age at interview§	0.01	0.08	1.01
Black‡	–0.43	0.30	0.65
Intercept	–0.71	1.31	na

*p<0.10. **p<0.05.

‡Dichotomous variable coded 1 if yes, 0 if no.

§Continuous variable.

Note: na=not applicable. Model Chi Square=58.77 with 10 degrees of freedom (p<0.01).

This knowledge, however, does not appear to be associated with preventive behavior. Our study found that specific knowledge about the protective effect of condoms is marginally predictive of condom use at last intercourse, suggesting that educational efforts should focus more on specific preventive actions. Such preventive actions, in turn, need to be linked with the individual's own risk-taking behavior.

We found that a young woman's risk-taking behavior does not appear to be strongly associated with her perceived personal risk of AIDS, nor is her perceived risk associated with preventive behavior. We suspect that even though our subjects know the facts about HIV transmission, they may also have a false sense of confidence that they can identify a bisexual, a drug user or an infected partner and thus avoid exposure. Assuming that they can identify a risky partner may be part of a more general risk-taking behavior pattern among adolescents.

The finding that perceived AIDS risk does not increase the odds of condom use at last intercourse is not consistent with the view described earlier that an individual's perceived susceptibility is an important determinant in taking preventive action. Since our analysis is based on cross-sectional data in which perceived risk is measured concurrently and condom use retrospectively, condom use at last intercourse could have reduced the respondent's current perception of risk. When data from a follow-up of these young women become available, we can explore whether perceived AIDS risk at baseline predicts subsequent risk-taking or preventive behavior.

We have also found that having asked a partner to use a condom was the strongest predictor of condom use at last intercourse, which suggests that adolescent women may have more influence over condom use than is normally assumed. Our finding suggests the importance of the woman's role in initiating this preventive behavior. In addition, the negative effects of several risk-taking behaviors on condom use suggest the existence of a pattern of risk-taking in which not using condoms is one component. Given this result, it is even more important that asking a partner to use a condom increases the odds of using one, independent of such risk-taking behaviors as having sex with older men.

Effective condom use probably requires two distinct sets of skills: technical skills (such as knowing where to obtain them, what type to use, and when and how to put them on, remove them and dispose of them); and social skills (such as negotiating the use of a condom with a partner and avoiding sexual intercourse with a partner who refuses to use one). Adolescent women may need special assistance both in acquiring the communication skills needed to negotiate condom use, and in feeling comfortable about using their influence in decision-making. One study suggests that failure to use condoms is related to a lack of communication skills among young women.[26]

Recommendations

The following recommendations are aimed at integrating AIDS prevention services into the provision of family planning services to adolescent women:

- Family planning providers should administer a personalized AIDS risk-assessment tool to adolescent women attending a family planning clinic. Afterwards, counselors should discuss a client's risk-taking behavior with her. The risk-assessment tool may be, for example, a questionnaire that the clinic client completes while waiting to be seen, or it could be an interactive computer program designed to identify risk factors. The tool should focus on the client's risk-taking behavior during a specified period (e.g., the last two months) to enhance recall. It is imperative that the individual client feel comfortable disclosing all forms of risk-taking behavior so that a set of behavioral objectives for risk reduction can be prepared for her specific case. (Such behavioral objectives might include avoiding casual sex, avoiding sex with intravenous drug users and using condoms regularly.)
- Based on results from the risk-assessment tool, HIV-antibody testing should be offered to any client who may have been exposed to the virus. In areas where HIV seroprevalence is high, it may be desirable to offer antibody testing to all clients. If family planning providers are unwilling or unable to provide antibody testing onsite, referral networks should be established.
- The use of condoms in conjunction with a spermicide containing nonoxynol-9

(which has been found to kill HIV in vitro[27]) should be recommended to all adolescent clients, including those receiving oral contraceptives, and condoms should be given to all clients. Family planning providers have traditionally preferred to prescribe oral contraceptives rather than barrier methods for adolescents. This has been the case both because of the pill's relatively high effectiveness rate and because the pill does not require forethought or a partner's cooperation and is, therefore, assumed to be more appropriate for adolescents. Condoms typically have been provided as a backup method to the pill rather than as a primary contraceptive method. The risks of exposure to HIV among inner-city adolescents require a revision of this approach, including the recognition that regular use of condoms plus spermicide may optimize both pregnancy prevention and disease prevention in this population.

- Group sessions should be offered to all adolescent clients to help them acquire the social skills needed to negotiate condom use or to avoid sexual intercourse with a partner who refuses to use one. The sessions' objectives would be to increase the adolescents' confidence in their ability to effectively insist on condom use and avoid high-risk sex, and to increase the frequency of these behaviors as well. These sessions could use techniques such as peer group discussions, role playing, peer counseling and modeling.[28]

One example of modeling would be using a videotape depicting a young woman as she learns to persuade her partner to use condoms—the videotape illustrates development of successful interpersonal and communication skills.[29] Another example would be using a "photonovel" (a booklet similar to a comic book in which photos of people replace cartoons) depicting a similar storyline. When members of the target population participate in producing the photonovel—including developing the locally relevant social situation, using local dialogue and posing for the photos—readers perceive the story content as more credible. (Positive changes in attitudes and behavior have resulted from use of photonovels among construction workers learning about worker safety and among teenagers learning about cigarette smoking cessation.[30]) If they prove to be effective in family planning clinics, the methods proposed here could be tested in settings reaching a broader segment of the high-risk adolescent population.

Including adolescent males in discussion groups may be quite beneficial and could both facilitate the learning of social skills and increase the perception that condoms can be made part of a pleasurable sexual relationship. Experimental trials are needed of the various approaches to social skills training, including evaluations of their impact on adolescents' self-efficacy and on preventive behavior.

Integration of AIDS prevention and family planning services for adolescents should be facilitated by the fact that most providers already have the type of professionals and service mix required to provide HIV prevention counseling and antibody testing or referral. Implementing all the ideas presented in this article might require additional funds for start-up, evaluation and additional staff time per client, however. Furthermore, procedures for maintaining confidentiality and for follow-up counseling and referral will be needed if antibody testing is to be offered on-site.

Resistance by staff could be an important obstacle to service integration. Prior to initiating such activities, some unanswered questions worth considering are whether family planning clinic staff will support the use of condoms—as both a contraceptive method and a means of disease prevention—for this age-group, and whether they will be willing to convey the importance of condom use to adolescents who are oral contraceptive users.

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Special Report

The 1988 Abortion Referenda: Lessons for the Future

By Patricia Donovan

In the wake of the U.S. Supreme Court's recent decision in *Webster* v. *Reproductive Health Services*,[1] which gave states greater authority to regulate abortion, both prochoice and right-to-life activists in several states are advocating referenda on abortion. In Oregon, for example, a right-wing group called the Oregon Citizens' Alliance has already begun collecting signatures favoring a proposed amendment to the state constitution that would ban all abortions except in cases of rape, incest or threat to the woman's life. They must collect 84,770 signatures by July 6, 1990, to get the measure on the November 1990 ballot.

By contrast, the Coalition for Choice in Massachusetts has proposed a constitutional amendment that would guarantee a woman the right to obtain an abortion during the first 24 weeks of pregnancy under any circumstances, and in the last trimester if it is necessary to protect her life or health or if the pregnancy resulted from rape or incest. It would also guarantee Medicaid funding of abortions for low-income women. However, the earliest this measure could appear on the ballot is 1992—only after it has received 50 votes in two successive years from the state legislature sitting in a special constitutional convention. To send the proposed amendment to the legislature, supporters must collect the signatures of 50,525 registered voters by November 22, 1989.

Seventeen states,* including Massachusetts and Oregon, permit such voter initiatives to amend the state constitution. Fifteen of these states, plus six others and the District of Columbia, allow voters to enact legislation directly through ballot initiatives.† In addition, 24 states‡ and the District of Columbia allow citizens to initiate a referendum on a law passed by the state legislature. The number of signatures required for a proposal to qualify for the ballot varies, but most often it is a percentage of the votes cast in the previous gubernatorial election. Citizen-sponsored initiatives on abortion have been common in recent years, although up to now they have primarily involved the narrow issue of whether the state should pay for abortions for poor women, and until 1988, were initiated exclusively by right-to-life groups.

Since 1978, nine statewide antifunding measures have been placed before the voters; four of these proposals also authorized the legislature to prohibit abortion if *Roe* v. *Wade*[2] is ever reversed, and three of the four took the additional step of establishing special constitutional rights for the fetus. Two of these antiabortion referenda have passed: In 1984, 50.4 percent of voters in Colorado approved an amendment to the state constitution eliminating abortion funding except when the woman's life is endangered; in 1988, by a vote of 51 percent to 49 percent, Arkansas voters passed a constitutional amendment that prohibits abortion funding§ and also declares that "the policy of Arkansas is to protect the life of every unborn child from conception until birth, to the extent permitted by the Federal Constitution."[3]

Seeking to restore abortion funding in Colorado and Michigan (where the legislature had prohibited abortion funding except to save the woman's life in 1987),** prochoice advocates initiated their first referenda since *Roe* v. *Wade*†† in 1988. Both proposals were defeated, 60–40 percent in Colorado and 57–43 percent in Michigan.

The 1988 referenda defeats were widely viewed as a serious setback for supporters of abortion rights. They also generated considerable concern within the prochoice community that the defeats would add fuel to the movement to use referenda to end funding in other states that have paid for the abortions of Medicaid recipients since the 1977 cutoff of federal Medicaid funds for most abortions. As a result of the *Webster* decision, however, it now appears that some prochoice supporters advocate use of the referendum process, and that the focus of future referenda will be broadened to encompass the more basic question of whether abortion should remain legal and, if so, under what circumstances.

At first glance, such a change would appear to be an advantage for the prochoice movement, since a woman's basic right to abortion has always enjoyed more public support than has abortion funding. Recent polls have found, for example, that while only 40 percent of the public thinks Medicaid should pay for abortions,[4] most Americans support legal abortion.[5] This dichotomy was clear in Colorado shortly after the election: Sixty-four percent of registered voters polled in April 1989 said they supported *Roe* v. *Wade* and 65 percent said they would support an amendment to the state constitution guaranteeing women

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*Arizona, Arkansas, California, Colorado, Florida, Illinois, Massachusetts, Michigan, Missouri, Montana, Nebraska, Nevada, North Dakota, Ohio, Oklahoma, Oregon and South Dakota.

†Arizona, Arkansas, California, Colorado, Massachusetts, Michigan, Missouri, Montana, Nebraska, Nevada, North Dakota, Ohio, Oklahoma, Oregon and South Dakota, plus Alaska, Idaho, Maine, Utah, Washington and Wyoming.

‡Alaska, Arizona, Arkansas, California, Colorado, Idaho, Kentucky, Maine, Maryland, Massachusetts, Michigan, Missouri, Montana, Nebraska, Nevada, New Mexico, North Dakota, Ohio, Oklahoma, Oregon, South Dakota, Utah, Washington and Wyoming.

§Arkansas has not paid for most abortions since federal Medicaid funding was cut off in 1977.

**The Michigan funding prohibition was enacted by the legislature in response to an initiative sponsored by Michigan Right to Life. It easily passed both houses of the legislature, which 17 times had voted to end abortion funding but had been unable to override the vetoes of Governors James Milliken and William Blanchard. Under the state's initiative process, citizen-sponsored legislation is not subject to gubernatorial veto.

††In 1972, advocates of liberalized abortion laws sponsored referenda in Michigan and North Dakota to permit women to obtain abortions before the 20th week of gestation. Both measures were soundly defeated.

the right to abortion,[6] yet a few months earlier, 60 percent had opposed the referendum restoring abortion funding.

Moreover, two 1986 referenda proposing an end to legal abortions as well as to public funding of them were defeated by wide margins in Massachusetts and Rhode Island—both heavily Catholic states. Prochoice advocates in those states focused their campaigns on a woman's right to decide whether to terminate a pregnancy and (in Rhode Island) on the implications of recognizing the fetus's right to life, rather than on the funding issue. The Massachusetts measure was defeated 58–42 percent, while the Rhode Island proposal lost by a margin of 65–35 percent.

Nevertheless, the defeats in Michigan and Colorado are cause for concern, because both prochoice campaigns had major weaknesses that could resurface in future referenda battles, whether the issue is funding or the legality of abortion. Both campaigns, for example, fell far short of their fundraising goals, and neither campaign had an effective grass-roots network, a critical factor in successful referendum campaigns. The Michigan effort was hampered by a weak campaign organization and constant tension within the prochoice coalition. The campaign in Colorado had a good organization, but some of the principal prochoice groups in the state did not play a major policy role in the campaign; for the most part, it was left in the hands of largely unknown individuals. Neither campaign was able to attract seasoned political activists or to develop a compelling message and mount an effective media campaign.

More abortion referenda are likely to appear. Measures sponsored by prochoice groups alone are under consideration in at least five states. Abortion-rights advocates need to be aware of perceived shortcomings or problems encountered in Michigan and Colorado so that similar difficulties can be avoided in the future.

The Petition Drive

Because prochoice groups in Colorado and Michigan chose to initiate referenda, they faced a more difficult task than their counterparts in other states who have been involved only in combating antiabortion campaigns. They had to draft language and gather enough signatures to qualify their proposal for the ballot. Then they had to convince voters to set aside a recently approved constitutional amendment (in Colorado) or law (in Michigan).

Drafting ballot language in Colorado proved to be a tortuous process for Colorado Taxpayers for Choice (CTC), the group that initiated the referendum. It took the collective wisdom of the organization's management, staff and advisory council, Planned Parenthood Federation of America, the National Abortion Rights Action League (NARAL), a pollster, out-of-state consultants, focus groups and even a semantics professor to produce what became Amendment 7.[7] The measure, which required a yes vote for passage, read: "Shall there be an amendment to repeal [the antifunding amendment to the state] constitution and to provide instead that the state . . . shall not prohibit the use of public funds for medical services for a woman solely because of her choice of whether or not to continue her pregnancy?"

With its double negative, the ballot language was difficult to understand, especially for voters reading it for the first time in the voting booth. Moreover, it required a yes vote, which referendum experts say is a disadvantage because voters unfamiliar with an issue are inclined to vote no. (Under Colorado law, proposals to overturn current law must require a yes vote.)

More problematic, however, was CTC's decision, apparently made after much debate, not to mention the word abortion. Kirk Mitchel, the campaign manager, believes that decision was a mistake because it left the campaign vulnerable to opposition charges that CTC wanted to deceive voters about the amendment's intent.

Whatever the impact of the charges of deception on the final outcome, it is clear that they allowed the other side to go on the offensive and control the debate from the outset of the campaign.

The drive to collect the 51,000 signatures needed to qualify the measure for the ballot was launched April 17, 1988. It was directed by Mitchel, a native Coloradan who had had some campaign experience in California. The petition drive appears to have been well organized and managed. Mitchel made certain that the campaign obtained necessary permissions from supermarket chains and other commercial establishments where volunteers would be gathering signatures; he made sure volunteers knew how to fill out petitions correctly so they would not be disqualified; and he scheduled groups of volunteers to work at a specific store or special event on a particular weekend morning or afternoon.

"It was an impressive operation," said Cathy Garbini, who served on CTC's management committee and was the campaign's chief fundraiser.[8] By August 1, the campaign had collected more than 85,000 signatures, easily qualifying the proposed amendment for the November ballot.

In contrast, the signature-gathering effort in Michigan floundered badly, and the People's Campaign for Choice (PCC), the coalition of prochoice groups that initiated the referendum, almost missed the filing deadline. Problems arose before the first signature was collected: The petitions had to be reprinted twice to correct a spelling error and then a printing error, mistakes that might have disqualified the petitions. Reprinting cost $13,000,[9] but even more damaging, some campaign participants believe, was the image of a bumbling campaign, a perception that made it difficult to attract competent, experienced political activists and to raise money.

In addition to the printing problems, the prochoice groups in Michigan seriously overestimated their ability to gather the 120,000 signatures needed by assuming they could simply send their members a batch of petitions and a set of instructions on how to proceed. Furthermore, PCC seemed unaware of procedures for obtaining permission to solicit signatures on commercial property; volunteers often arrived at shopping malls only to be told they were not permitted to gather signatures on the property. In other places, they found themselves unwelcome by merchants who feared harassment from right-to-life activists: "You couldn't put your foot in the door without the antis calling the manager to complain," observes Judith Frey, PCC's chief spokesperson.[10]

In part, these problems reflected the lack of adequate planning for the petition drive, which had been directed by a Washington, D.C., consulting firm hired by PCC. In addition, they were related to the top-heavy structure of the prochoice movement in Michigan, which consists largely of heads of organizations whose principal focus is on lobbying the legislature and the governor. Thus, prochoice organizations do not have a large membership base on which to draw. "Very little attention was given to grass-roots development, [which is] what is needed in a petition drive," notes Howard Simon, executive director of the American Civil Liberties Union (ACLU) of Michigan and a member of PCC's executive committee.[11] Another executive committee member, Mary Addison, agrees: "We had not spent time building up membership."[12]

Ultimately, the campaign was forced to hire a California company that specializes in signature gathering—at a cost of 50 cents per signature. Some 230,000 signatures were eventually collected, but "[t]he petition drive ate up [the campaign's] energy, morale and resources," says the ACLU's Simon.[13] According to one report, the petition drive consumed about $650,000[14]—most of the money raised by the campaign to that point and more than a third of its total revenue for the entire campaign.

The measure, which qualified for the ballot in March 1988, required a no vote for approval to overturn the statute. Entitled "Proposal A: Restrict Use of Tax Funds for Abortions for Persons Receiving Public Assistance," the referendum read: "Public Act 59 of 1987 is a law that states that tax funds shall not be used to pay for an abortion for a person receiving public assistance unless to save the life of the mother. Should the law be approved?"

Staffs and Coalitions

Until midsummer 1988—barely four months before Election Day—Michigan's PCC did not have a campaign staff. It was directed by an unwieldy coalition of 44 state groups and a 14-member executive committee plagued by turf battles, differences over strategy and an unwillingness to turn over decision-making to its most politically experienced members.

C. Montgomery Johnson, an expert on referendum campaigns who was hired by Planned Parenthood Federation of America to analyze the Michigan and Colorado efforts, contends that an effective campaign organization can make a difference of as much as eight percentage points in the outcome of a campaign: "A winning campaign cannot be effectively . . . or successfully run through a council of coalition members," he asserts, adding that a winning campaign requires "a campaign organization [consisting] of representatives of key coalition members [selected] because they [are] the best, most pragmatic, *least* ideological [and] most experienced women and men in statewide election campaigns. . . . The Michigan campaign was run through an executive committee of people who apparently primarily represented their organizations' view."[15] Janet Katowitz, PCC's deputy campaign manager, believes this structure was the campaign's biggest flaw: "It was unworkable. . . . The inability of the coalition to make basic day-to-day decisions" led to the decision to hire consultants.[16]

From June 1987 to June 1988, the campaign was essentially run by the Washington, D.C., consulting firm that was hired to direct the petition drive, as well as to plan the general campaign and hire a permanent staff, even though the firm had had little direct experience in Michigan. During this time, a member of the firm spent three days a week in the state. Another consultant was hired by the firm to do fundraising. "We relied on the consultants to do everything," observes Addison, a member of the executive committee and executive director of the Michigan Women's Commission.[17]

Some campaign participants believe these consultants took advantage of the coalition members' political naiveté: "These high-powered D.C. consultants said they could do XYZ and [we] believed it. [They] knew whom they were talking to," Katowitz asserts.[18] "A lot of people saw an opportunity to make a lot of money—and they did, at the expense of the campaign," maintains Carol King, who became chairperson of the PCC executive committee late in the campaign.[19] King and others were particularly irked that the firm was given responsibility for hiring a permanent campaign staff. "[It] had a vested interest in not developing an indigenous staff because that meant a smaller pay check [for the firm]," Katowitz maintains.[20]

Whatever the consultants' flaws, discussions with members of the executive committee and staff indicate that PCC failed to give their consultants adequate direction and to demand full accountability for the money they spent: "The coalition did not ask a lot of questions," King notes.[21]

The differences of opinion split largely along geographical lines, with Detroit-based members of the executive committee highly critical of the firm and Lansing-based members (some of whom were responsible for hiring the firm) much more tolerant. There was, in fact, constant tension between the two groups, not only over the consultants' performance but also over campaign strategy and even the location of the campaign's headquarters—which was still an issue in September 1988, just two months before the election.

Because the groups that initiated the referendum were based in Lansing, the campaign's headquarters was based there. But Detroit and its suburbs are the state's most populous area and its media, fundraising and commercial center. For these reasons, PCC executive committee members in Detroit felt strongly that the campaign should be based there. Simon, of the ACLU, explains, "Nothing progresses in Michigan . . . unless it carries Wayne County [which includes Detroit] . . . and to do that you must carry Detroit; to do that you must have black [support]."[22]

In fact, the campaign received little visible support from blacks—and, in particular, from Detroit Mayor Coleman Young, who controls a potent political machine. Several executive committee members are convinced that the campaign's failure to establish an early presence in Detroit contributed significantly to the lack of support from Young. The campaign eventually opened a satellite headquarters in Detroit, and in September the media operations were moved to the Detroit area. But by then, many believe, it was too late to have a significant impact. On Election Day, Proposal A carried only three counties in the state; it lost in Wayne County by almost 21,000 votes.

PCC did not hire a permanent campaign staff until the summer of 1988, by which time most experienced political professionals had already joined other campaigns. Jeremy Karpatkin, a young New Yorker who had worked in Senator Paul Simon's unsuccessful campaign for the Democratic presidential nomination, was chosen to be the campaign manager. Although some members of the executive committee argue that Karpatkin was too young, inexperienced and unfamiliar with Michigan politics, some campaign participants believe that by the time he was hired and the rest of the staff was assembled, it was virtually too late for him to have had much of an effect on the outcome of the election.

In large measure, many of the campaign's problems stemmed from the lack of statewide electoral experience of the major prochoice groups and from their lobbying orientation: "The coalition had lobbying and legislative expertise . . . [but] did not know . . . how to run a political campaign," observes Marie Bass, a Washington consultant whose firm was briefly involved in the campaign.[23]

Colorado's campaign organization was substantially better than Michigan's. It had a board of directors; a five-member management committee that set overall strategy and directed the campaign; a hired campaign staff that conducted day-to-day activities; and an advisory council of over [illegible] groups, including the state affiliates of Planned Parenthood, NARAL, the Religious Coalition for Abortion Rights and the ACLU, as well as the League of Women Voters, Colorado Nurses Association and the Colorado Women's Bar Association.

In contrast to PCC, CTC hired a campaign director a year before the election, which enabled planning for the general campaign to begin before the petition drive was over. Other staff joined the movement early in 1988. CTC did have problems filling some key staff positions, however. A press spokesperson was not hired until September, and the field director left shortly after the petition drive ended and was not replaced.

In addition, Mitchel says, "I interviewed 10 women to head the fundraising operation, but none would take the job." He believes "the turf wars and finger pointing after the defeat in 1984" were to blame.[24] Cathy Garbini, who ultimately took the fundraising position, adds, "The [1984] loss sent a message . . . which was difficult to [overcome] . . . that the [referendum] was not really do-able. We felt constantly on the defensive."[25]

The problem was exacerbated by the 1986 announcement that the state's two major abortion-rights groups—Rocky Mountain Planned Parenthood and the Colorado Abortion Rights Action League—would not join an attempt that year to reverse the antifunding amendment, because in their judgment, the effort could not be won. Their action was widely seen as undermining CTC's ability to raise money for the 1986 reversal attempt, which was eventually shelved. Although both groups were members of the CTC Advisory Council in the 1988 campaign, neither assumed a leadership role in the effort.

Grass-Roots Structure and Funding

An analysis of the 1984 Colorado referendum concluded that CTC's lack of a strong grass-roots structure, combined with the extensive right-to-life network in the state, was a major factor in the passage of the amendment cutting off abortion funding.[26] Four years later, CTC was still without a substantial grass-roots operation in the rural areas of the state. As mentioned previously, their counterparts in Michigan had virtually no grass-roots organization at all. The right-to-life movement, on the other hand, was well organized in both states, primarily through Catholic and fundamentalist churches, and was especially strong in Michigan.

"Right to Life of Michigan was an incredibly organized and well-funded machine long before the referendum," notes Dawson Bell, a correspondent for *The Detroit News*. "Its grass-roots fundraising was in place; . . . it did lots of direct mail. . . . The annual public fight [over Medicaid funding] does wonders for recruitment."[27]

Right to Life of Michigan claims some 100,000 individual members, 25 paid employees and 110 local affiliates. In 1987, it had mobilized 17,000 volunteers to gather signatures to put an antifunding initiative before the legislature. It collected over 416,000, many more than the 191,726 needed to send the proposal to the legislature, and did so in just 83 days.[28] When Proposal A qualified for the ballot, thousands of volunteers began voter identification and education operations (both door-to-door and by telephone) in preparation for Election Day.

In contrast, the prochoice community in Michigan had no organized supporters in the field. As a result, says Barbara Fuller, who worked on the campaign during the petition drive and is now an aide to a state senator, the movement had "no institutional structure to turn the heat up when it was needed. [It] started from ground zero."[29]

Moreover, unlike Michigan Right to Life and the Colorado Right to Life Committee—and also unlike successful efforts to defeat antifunding referenda in states such as Washington, Rhode Island and Massachusetts—there was no organization within the prochoice community in either state that was a natural leader of the referendum effort. As was pointed out earlier, prochoice groups in Colorado were satisfied to participate in the monthly meetings of the organization's Advisory Council. Planned Parenthood had the most developed prochoice network in Michigan, but none of its nine affiliates has been active in statewide races.

"No one in the five big prochoice groups had statewide campaign experience," says Margy Long, formerly with Planned Parenthood of Mid-Michigan and now coordinator of the Planned Parenthood affiliates' public affairs office in Lansing.[30] As a result, says consultant Bass, the prochoice movement in Michigan was "not viewed by big-time politicians as a force to be reckoned with,"[31] and the referendum could not win the active and visible support of key political leaders like Governor James Blanchard and Senator Donald Reigle.

"The politicians wanted us to go away," Carol King says. "They said, 'I support you, but please leave me alone, I can't do anything.'"[32] The Michigan Democratic Party platform did not mention Proposal A. The campaign also failed to gain the support of major labor and civil rights groups in the state.

The superior organization of right-to-life advocates in Michigan and Colorado was readily apparent in their ability to raise money. The Committee to End Tax-Funded Abortions in Michigan raised about $3 million from 60,000 individuals, the vast majority of whom were Michigan residents who contributed less than $50.[33] It also received donations of $50,000 from the Knights of Columbus and the owner of Domino's Pizza, Tom Monaghan, and a $20,000 contribution from the president of Amway Corporation, Richard DeVos.[34]

PCC, on the other hand, raised about $1.5 million from 9,428 contributors.[35] This was far short of the $4 million that had been projected by the consultants. (Less than half of the amount raised was spent on actual campaign activities, such as communications, research, development of commercials and field activities. The rest went to pay consultants, to finance the petition drives, to conduct fundraising and to cover administrative costs.)

PCC was unable to tap Democratic donors who traditionally give large amounts, probably because the campaign lacked a finance committee with ties to the key potential contributors and because Governor Blanchard declined to play an active role in the campaign. Ultimately, the campaign raised more money from Republicans, largely through the efforts of PCC spokesperson Frey, who had founded Republicans for Choice in the mid-1980s and who was well connected to wealthy Republicans. Many potential donors told the campaign they supported the referendum but were unwilling to contribute to the campaign for fear that their employees or right-to-life groups would protest.[36]

In Colorado, CTC raised some $540,000—nearly twice the amount it raised in 1984 but only half of the amount they projected was needed for the campaign. About two-thirds of the 4,800 donors were Colorado residents, but about $110,000 of the total raised was contributed by national prochoice groups, nearly $23,000 came from state affiliates (principally from Rocky Mountain Planned Parenthood) and almost $75,000 was donated by other national and local groups that support abortion rights.[37] Some 2,000 donors who contributed to the 1984 campaign, including several large contributors, did not give any money to the 1988 effort.[38] CTC's Mitchel believes that bitterness over the 1984 loss was a major reason.

More problematic than the amount raised was the timing of the contributions. CTC's requests to national prochoice organizations for early donations to enable the campaign to conduct public opinion research were rejected. CTC received almost 40 percent of the total amount raised after October 20, and $50,000 came in during the last week of the campaign—too late to have an appreciable impact on the outcome. The last-minute contributions, observes Johnson in his analysis of the campaign, "knee-capped" the impact of media buys, in both the quality of buys and the amount. "The opponents had more media money [and] were able to spend it more effectively because they had it when they needed it."[39]

For the easier task of defending the status quo, Colorado right-to-life organizations raised a total of $320,000 from 641 donors, and they received the equivalent of $89,620 in other support, including $60,000 worth of television time donated by an advertising firm, according to records filed with the Colorado Secretary of State.[40] CTC officials believe, however, that the antireferendum campaign raised substantially more than has been reported, since expenditures for a public opinion survey, a fundraising video and other known outlays are not included in its reports.

Media Campaigns

Without a strong grass-roots network, CTC and PCC relied heavily on their media campaigns to persuade voters to support a restoration of abortion funding. Neither organization, however, could match the advertising campaign mounted by their opponents, either in terms of the effectiveness of their message or the amount of air time they were able to purchase.

Both CTC and PCC built their media campaigns largely around the theme that it is unfair to deny poor women and teenagers access to abortion, especially if they become pregnant through rape or incest. Yet polls and focus groups conducted by the two campaigns early in 1988 indicated that this was not a compelling message, at least for undecided voters. A CTC poll showed that 59 percent of voters believed that elimination of funding had not caused any problems.[41] A PCC poll indicated that over half of Michigan voters did not think a ban on Medicaid abortions discriminated against the poor, two-thirds thought that too many women use abortion as a method of birth control and more than eight in 10 were troubled by the idea that some women had more than one abortion.[42]

Furthermore, focus groups convened by PCC expressed concerns about abuses of the welfare system and doubts that elimination of funding had a significant impact on the ability of poor women to get abortions.[43] The focus groups "gave us all our opponents' messages," says Mitchel.[44]

But, "[n]one of the messages on which probably a half million or more dollars were spent [by PCC] addressed *or avoided* any of these pitfalls that could be seen miles down the road," Johnson observes. He adds, "we were not reading our polls, or not paying much attention to what the public was telling us through them and through the focus groups." PCC "aimed its spots to appeal to the bleeding hearts; [its opponent] aimed theirs at some three and three-quarters million Michigan voters . . . all of whom pay taxes . . . and very few of whom . . . could identify with the 'welfare poor,' 'the raped,' or 'the incestuously impregnated.' "[45]

The opponents of abortion funding in Michigan and Colorado assiduously avoided the issue of the morality of abortion. They skillfully tapped voters' fears of higher taxes and resentment over perceived welfare abuses and subtly implied that taxpayers were being asked to pay for the consequences of promiscuous behavior on the part of poor women. In an ad that ran in both states, for example, a group of young professionals are discussing the "tax-paid abortion business." Members of the group differ over whether abortion should be legal, but they agree that "it's not fair to force taxpayers to pay for them."

Another ad that ran in Colorado told voters that more than 40 percent of tax-funded abortions in the state are repeat abortions and that some women have as many as seven abortions. "If Amendment 7 passes . . . you'll pay for these abortions every time," the commercial warns. A Michigan ad emphasized that the state paid $6 million a year for abortions and that welfare costs have not gone up in states that have eliminated abortion funding.

Both PCC and CTC failed to effectively challenge their opponent's message that an end to abortion funding would save taxpayers money, although data refuting this claim are available. A cost-benefit analysis of public funding of abortions, for example, shows that for every dollar Michigan and Colorado pay for abortions for poor women, they save almost $5 in public medical and welfare expenditures.[46]

The opponents' ads were produced by Roger Ailes, the Republican media expert who developed the ads for George Bush's presidential campaign. There is wide agreement among prochoice advocates in both states that both visually as well as in the message they carried, the commercials were far superior to those produced by PCC and, especially, CTC: "Their ads were spectacular, clever, entertaining. . . . Ours were soggy noodles [by comparison]," says Ruth Steele, founder of CTC and a member of the 1988 management committee;[47] Mitchel likened the antireferendum ads to Coca-Cola commercials in their entertainment and visual impact.[48]

Not only were the opponents' commercials better produced and more compelling, they were also on the air more often and for a longer period. Neither prochoice campaign ran any television commercials until two weeks before the election, because of a lack of money. (In addition, neither purchased any print ads, although both ran a few radio commercials.) The antifunding ads were televised two weeks sooner and ran twice as often as those of CTC or PCC.

The saturation advertising by the antiabortion groups appears to have had a strong—perhaps even decisive—impact on the outcome of the Colorado referendum. Johnson points out that in a May 1988 CTC poll a slight majority of voters supported a restoration of funding and that for most of the campaign the race was neck and neck. "Public opinion didn't really start sliding to the negative side until about five days before the election . . . after the opponents [of Amendment 7] had been on television nearly twice as long as proponents, with twice the frequency of spots and with a message that proponents agreed was far superior to the message [CTC] used."[49] The opponents' ad campaign "had a devastating effect . . . If you look at when these ads kicked in, that's when the damage was done," Edward Zorensky, the organization's press secretary adds.[50]

Johnson also points out that the margin of victory largely reflected the opposition's success in capturing the undecided vote: "A cutting message with lots of TV fire power will do that for you . . . in a ballot issue campaign," he says.[51]

Conclusions

"If you don't have the money to go on television, or the existing grass-roots infrastructure to 'get out the vote,' you don't have a winning campaign," maintains Lydia Neumann, vice president of public affairs for PPFA.[52] Neither campaign in 1988 had either of these critical elements, and each lost by a wide margin. Given these outcomes, and also given that earlier successful efforts to defeat antifunding referenda in other states were well financed and had strong grass-roots support, abortion rights advocates need to realistically assess their ability to raise enough money and make sure they are well organized at the grass-roots level before they sponsor referenda in the future.

The consultants hired to run much of the Michigan campaign projected a budget of $4 million, but the campaign ultimately raised only $1.5 million—about half of what the opposition raised and spent. In Colorado, CTC had projected it needed $1 million to win; it raised only half that amount, of which nearly 40 percent came in too late to have a significant impact. In both states, the fundraising shortfall made it virtually impossible for CTC and PCC to match the expensive, sophisticated media campaigns mounted by their opponents.

Johnson asserts that for years, antiabortion groups had been fundraising through churches and other religious groups. The referendum's proponents, on the other hand, had no established statewide structure for raising funds. "The prochoice, profunding community cannot hope to keep pace with such money-raising efforts by only raising money on a panic . . . basis during several months prior to an election," he says. "For the opponents, this effort is a year-round business."[53]

Grass-roots organizing and voter education, which also must be a year-round effort, proved to be one of the opposition's great strengths and one of the prochoice groups' major weaknesses in both states. In Michigan, repeated vetoes of funding restrictions by Governor William Milliken and his successor, Governor James Blanchard, and the abortion-rights groups' success in persuading the legislature to uphold those vetoes had led them to overlook the importance of an organized network of followers throughout the state. As a result, they did not have the support they needed when the referendum campaign began. Many people believe that it takes a year, at a minimum, to develop a grass-roots network and that this network must be in place before a campaign begins.

The Michigan campaign was plagued by the unwillingness of many coalition members to turn over day-to-day decisions to a small group of coalition representatives with statewide electoral experience (such as the six-member steering committee that directs the 60-member Coalition for Choice in Massachusetts), and who therefore understood the difference between an election campaign and lobbying activities. Without such a core group, the Michigan campaign was inefficient and wasted its resources. CTC had a good management committee, but the groups most closely identified with the abortion rights movement—those in the best position to galvanize support for the referendum—did not play a major role in the campaign.

In addition to a core of experienced activists to direct the campaign, sponsors of abortion rights referenda need to hire, either as staff members or as consultants, the best specialists in conducting public opinion research, in conceptualizing and creating media campaigns, in raising funds and in organizing other aspects of a successful campaign. Consultants need clear instructions about what is expected of them, and they must be accountable to the management group. State groups may not be in the best position to judge a consultant's expertise, and the national abortion rights organizations might serve a valuable clearinghouse function in that regard.

The 1988 experiences showed that with the help of skilled pollsters and media consultants, antiabortion groups can develop compelling messages and package them effectively in media campaigns. Johnson argues that referendum advocates must conduct early in-depth polling and focus-group research to find arguments persuasive to groups outside the prochoice constituency and to help supporters assess whether they have a realistic prospect of winning a referendum campaign. But then the information must be heeded, of course; in 1988, both prochoice campaigns relied on a theme that even their own polls and focus groups indicated would not sway undecided voters, let alone those who considered themselves antiabortion.

The *Webster* decision has left abortion rights activists anxious to go on the offensive, and sponsoring a statewide referendum to protect a woman's right to terminate an unwanted pregnancy may appear to be an effective strategy. Initiating a statewide referendum is a major, and potentially risky, undertaking, however, as the experiences in Michigan and Colorado attest. Groups considering a referendum must earnestly assess their ability to raise the necessary funding and they must have both a strong grass-roots network in place and a broad, united coalition of prochoice organizations willing to relinquish decision-making to a small group of their most politically experienced and pragmatic representatives. Without these conditions, future referenda could suffer the same fate as those in Michigan and Colorado.

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Research Note

Aggregate and Lifetime Contraceptive Failure In the United States

By James Trussell and Barbara Vaughan

Our understanding of contraceptive failure in the United States has been considerably enhanced by analyses based on the National Fertility Surveys and the National Surveys of Family Growth (NSFG).[1] These studies have provided estimates of the probability that a woman will experience an accidental pregnancy (usually within only the first year of any segment of contraceptive use) and of the characteristics of women more prone to experience a contraceptive failure. Their results have yielded a fairly consistent set of first-year failure rates, known as typical use-failure rates, for all methods as they are used and misused by women and couples.

We still have only a minimal understanding, however, of the failure rates of various methods when they are used correctly and consistently, that is, perfect use failure rates.[2] We also have little information on the risk of failure in actual use past the first year, although it is well-known that failure rates decline with duration of use.[3] The decline may be explained either by the selection hypothesis, in which risk-takers and the most fecund become pregnant soonest, leaving a pool of increasingly more careful, less fecund users as time passes, or by the practice-makes-perfect hypothesis, in which women (or couples) become better users with experience.

Information from clinical trials cannot be used to resolve these questions because the requisite data on consistency and correctness of use are not collected.[4] Another problem arises because samples of users of different methods are self-selected; thus, method-specific failure rates cannot be assumed to apply to a hypothetical woman selected at random from the population.

Although this research note will not address these important unresolved questions, it will fill two other gaps in our knowledge of contraceptive failure. It will provide direct estimates of the aggregate annual number of contraceptive failures in the United States and of the cumulative lifetime number of contraceptive failures experienced by a typical woman.

We base our calculations on data collected in the third cycle of the NSFG (1982), which, like the other three cycles (conducted in 1973, 1976 and 1988), provides current information on childbearing, contraception, breastfeeding and other aspects of reproductive behavior. The sample for the 1982 NSFG was drawn from all women aged 15–44 living in the coterminous United States, regardless of marital or fertility status. Personal interviews conducted by trained female interviewers and lasting approximately one hour were completed with 7,969 women between July 1982 and February 1983. Blacks and women aged 15–19 were over-sampled. The NSFG collected retrospective information on all pregnancy intervals for each woman. Since complete information on contraceptive use was collected only for pregnancy intervals ending after January 1979, our analysis is confined to the three-year period beginning with this date and ending with December 1981.*

Aggregate Failures

The total weighted number of reported contraceptive failures from 1979 through 1981 was 3.94 million. Thus, the average annual number of failures during that period was 1.32 million. Reasons have been voiced for concluding both that this estimate of the annual number of contraceptive failures is inflated and that it is too low. Evidence for believing that it is inflated is based on recognition that estimates of contraceptive failure derived from the NSFG are substantially higher than estimates from clinical trials.[5] Some women may attribute their unintended pregnancies to contraceptive failure when in fact they had ceased to practice contraception, thereby inflating the risk of failure. Nevertheless, there are good reasons for expecting clinical trials to yield lower failure rates. First, women who volunteer for clinical trials may be more highly motivated than typical users. Second, women whose behavior is continuously monitored may use a method more consistently and correctly than they would have otherwise. Third, poor results from clinical trials are less likely to be submitted for publication or to be published. Therefore, although women may attribute too many pregnancies to contraceptive failure, there is no empirical basis for testing this hypothesis.

On the other hand, some contraceptive failures are almost certainly not reported in the NSFG, because some pregnancies are not reported. Pregnancies leading to birth are completely recorded, but those ending in either spontaneous or induced abortion are not. For example, only 61 percent of spontaneous abortions and 50 percent of induced abortions in the 1979–1981 period were reported in the 1982 NSFG.[6] In calendar year 1981, white married women reported nearly all induced abortions, while black married women reported fewer than half (39 percent). Unmarried women reported a smaller proportion of induced abortions (52 percent among whites and 34 percent among blacks) than did married women.[7] What proportion of these omitted abortions resulted from contracep-

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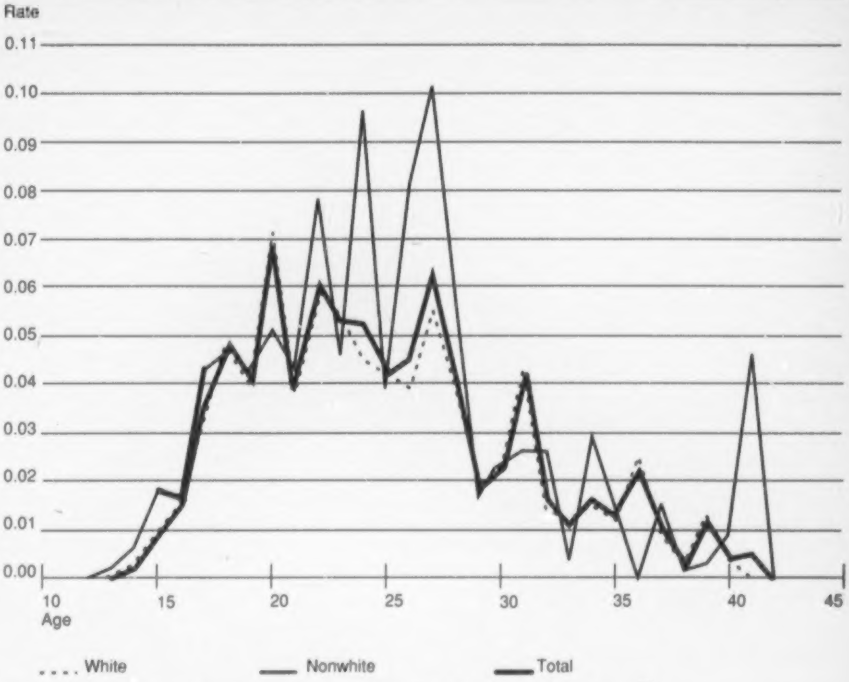
James Trussell is professor of economics and public affairs and Barbara Vaughan is a member of the technical staff, both with the Office of Population Research, Princeton University. Noreen Goldman and two anonymous referees provided helpful comments on an earlier draft of this paper.

*Two previous analyses of contraceptive failure during the first year based on the 1982 NSFG (see: W. R. Grady, M. D. Hayward and J. Yagi, 1986, reference 1; and E. F. Jones and J. D. Forrest, 1989, reference 1) utilized the period from January 1979 through June 1982. We decided to discard information from calendar year 1982 to avoid any biases resulting from seasonality. However, results were virtually identical when we used all exposure from January 1979 through the third month preceding the interview date. (Information about the month of interview and the preceding two months was ignored to avoid the possibility that women were unknowingly pregnant at interview.)

tive failures is, of course, unknown.*

To overcome the problem of underreporting of induced abortions, The Alan Guttmacher Institute conducted a special survey of abortion patients in 1987.[8] The results indicated that 43.5 percent of induced abortions followed contraceptive failures. If this estimate is also valid for the 1979–1981 period, when the average annual number of induced abortions was 1.54 million,[9] then there would have been 0.67 million contraceptive failures followed by induced abortion annually. Only 0.38 million contraceptive failures leading to induced abortion were reported each year in the NSFG. Therefore, if the 0.29 million contraceptive failures estimated to be unreported each year are added to the 1.32 million reported failures, we obtain an adjusted estimate of 1.61 million contraceptive failures annually. Of course, even this estimate is conservative because it ignores unreported contraceptive failures leading to spontaneous abortions. Our estimate is also too low by a slight additional amount attributable to contraceptive failures among women aged 45 and older, who were not interviewed in the NSFG.†

Figure 1. Age-specific contraceptive failure rates, adjusted for underreporting of abortion, by race



Source: Estimated from the 1982 NSFG and based on the three-year period 1979–1981.

Lifetime Failures

Through the use of simulation models of reproductive behavior, several investigators have produced estimates of the number of contraceptive failures that a woman would experience during her reproductive years.[10] The goal of most of this work has been to examine the health risks of various contraceptive scenarios. The results are informative and useful, but the investigators never intended to produce estimates of the lifetime number of contraceptive failures that a typical woman would actually experience. Indeed, since so many untestable assumptions are involved, particularly those concerning the risk of failure during the entire reproductive span, their results should not be used for this purpose.

Our approach is to compute a total contraceptive failure rate (TCFR) analogous to the total fertility rate. We first compute single-year age-specific contraceptive failure rates, analogous to age-specific fertility rates, for women ages 12–44. The numerator at each age is the total number of contraceptive failures; the denominator is the total exposure contributed by all women at that age regardless of contraceptive, marital or coital status (just as it is for the age-specific fertility rate). Next, we sum the age-specific rates to obtain a reported TCFR of 0.67 contraceptive failures per woman. If unreported failures leading to induced abortion are included—by counting each reported induced abortion that results from a contraceptive failure as equivalent to 1.76 true induced abortions (0.67 million actual abortions per year divided by 0.38 million reported per year)—we obtain an adjusted TCFR of 0.81.

Age-specific contraceptive failure rates, adjusted for unreported contraceptive failures leading to induced abortion, are plotted in Figure 1. Overall, the rate rises sharply beginning in the late teenage years and remains high until around age 30. While there is great variation in the rate for nonwhites because of small sample size, most of the cumulative difference between races is the result of higher contraceptive failure rates among nonwhite women aged 20–29.

The TCFR must be interpreted precisely: It is the average number of failures that a hypothetical woman would experience if, during her life, she faced at each age the risk of contraceptive failure actually observed in the 1979–1981 period. The age-specific risks are governed by a number of factors: the proportions of women having intercourse and their frequency of intercourse; the proportions practicing contraception, their mix of contraceptive methods and the consistency and correctness of their contraceptive use; pregnancy outcomes (births or induced abortions); and the underlying fecundity of the women and their partners.‡ Therefore, the TCFR is very unlikely to pertain to any individual woman or even a cohort of women, because all the proximate determinants listed above are likely to change through time. Nevertheless, the estimate is a convenient

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*Both Hammerslough (see: reference 6) and Grady and colleagues (see: W. R. Grady, M. D. Hayward and J. Yagi, 1986, reference 1) attempted to adjust failure rates derived from the 1982 NSFG to correct for omitted induced abortions. The results, however, depend heavily on assumption. Grady and colleagues applied the same adjustment factor to all methods, and this common factor is based on all abortions, not just on those that occurred in the first year of method use. Hammerslough used supplemental data from four states and from a multistate survey (together comprising about nine percent of the national total) to estimate adjustment factors specific to each method, but he could not identify first-year abortions separately either.

†Moreover, very little exposure at age 44 is included in our analysis because women aged 44 at interview would have been six months to a year younger in the last month of our analysis period. Likewise, exposure at ages 43 and 42 is reduced, though to a lesser extent. However, no failures were reported at any age above 41; the average failure rate at ages 37–41 is only 0.0057, and the average failure rate at ages 40–41 is only 0.0040. Thus, the resulting downward bias is likely to be small.

‡Fecundity is reduced by sexually transmitted diseases, particularly chlamydia and gonorrhea, and by breastfeeding. Therefore, fecundity may vary as the prevalence of these infections or the prevalence or intensity of breastfeeding changes.

Table 1. Total contraceptive failure rates, by various scenarios, according to race

Scenario	Total	White	Nonwhite
Reported	0.67	0.67	0.63
Adjusted for underreporting of induced abortion	0.81	0.78	0.98
Adjusted for underreporting of induced abortion and by excluding sterilization	0.97	0.94	1.13
Adjusted for underreporting of induced abortion and by excluding noncontraceptive intervals	1.60	1.56	1.83
Adjusted for underreporting of induced abortion and by excluding noncontraceptive intervals and sterilization	1.96	1.90	2.32

Source: Synthetic estimates from the 1982 NSFG and based on the three-year period 1979–1981.

summary statistic that pertains to a specific period of time. This estimate is conservative because it does not include contraceptive failures that ended in unreported spontaneous abortions and, less importantly (for reasons explained earlier), because women aged 45–49 are omitted from the calculation.

The total fertility rate (TFR) in 1979–1981 averaged 1.82.[11] By dividing the TFR by the TCFR (1.82/0.81), we obtain a result that implies that the typical woman will experience one contraceptive failure for every 2.25 live births during her lifetime, so contraceptive failures are not uncommon relative to live births. Nevertheless, it may surprise many people that our estimate of the TCFR is so low, and it must be remembered that several factors operate to make the TCFR smaller than one might expect. First, because failure rates decline with duration of use,[12] the average annual risk of contraceptive failure is much smaller than published first-year rates.[13]

Second, substantial proportions of women are not exposed to the risk of contraceptive failure because they or their partners have been sterilized. In our analysis, 39 percent, 54 percent and 56 percent of the women aged 30–34, 35–39 and 40–44, respectively, were protected by sterilization. If we remove the exposure of women protected by sterilization from the denominator in calculating age-specific contraceptive failure rates, we obtain an estimate of 0.80 reported lifetime contraceptive failures and 0.97 adjusted lifetime contraceptive failures for the typical woman who relies solely on reversible methods when she uses a contraceptive.

Finally, contraceptive failures cannot be experienced by women who do not use a method of contraception. The annual numbers of contraceptive failures experienced by teenagers are particularly low for this reason. We can adjust for this factor by removing from the denominator of each age-specific failure rate all periods of exposure when women are not practicing contraception, except for the gestation period following a contraceptive failure.* This TCFR indicates that a woman who practiced contraception throughout her lifetime with the intention of avoiding pregnancy altogether would experience 1.60 contraceptive failures; if she relied solely on reversible methods, she would experience 1.96 contraceptive failures.

The results, shown by race in Table 1, indicate that reported TCFRs for whites and nonwhites are virtually identical. However, since nonwhites are less likely to report abortions,† the TCFR is 26 percent higher for nonwhites than for whites when it is adjusted for abortion underreporting. Excluding sterilization or nonuse (or both) slightly narrows this differential. White women who seek to avoid pregnancy throughout their lives by using only reversible methods of contraception would experience 1.90 failures on average; the corresponding number of failures for the typical nonwhite woman is 2.32.

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*We retained the reported gestation time following a contraceptive failure in the calculation of exposure, but we made no further adjustment to exposure when we corrected for unreported induced abortions following contraceptive failures. If such unreported abortions were masked by reported contraceptive use, the denominators for the abortion-adjusted rates would be correct, but the denominators for the rates unadjusted for abortion would be slightly too large (by about three months per unreported abortion). If, on the other hand, unreported abortions are masked by reported nonuse, the denominators for the abortion-adjusted rates would be slightly too small, and the denominators for the rates unadjusted for abortion underreporting would be correct.

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Research Note

Cesarean Section Rate Levels Off in 1987

By Selma M. Taffel, Paul J. Placek and Mary Moien

Introduction

U.S. obstetric practices have changed dramatically over the past two decades, with perhaps the greatest difference from 20 years ago being physicians' increased willingness to perform cesarean deliveries. Once a rare event, a cesarean section is now being performed in one out of every four deliveries. In fact, cesarean delivery has become the most frequently performed major surgical procedure among women of childbearing age.[1]

The decision to perform a cesarean section is prompted by the physician's concern for the life and health of the mother or the child. Nevertheless, the ever increasing recourse to major surgery at the time of delivery has caused considerable controversy: The medical risks to both mother and baby are much greater when abdominal surgery is performed, and it has been argued that the potential for subsequent physical, emotional or psychological problems for the mother is substantially higher. In addition, cesarean delivery is much more expensive than vaginal delivery.[2]

Since 1965, national cesarean section rates have been tracked by means of data collected in the National Hospital Discharge Survey (NHDS), which is conducted by the National Center for Health Statistics of the Centers for Disease Control. These data have been used to monitor trends in cesarean section practice and to conduct in-depth studies related to cesarean delivery. Each year, medical and demographic data are collected on approximately 200,000 patients discharged from a nationally representative sample of about 400 short-stay, nonfederal hospitals.

For example, in 1987, data were collected from the medical records of about 180,000 patients; around 18,000 of these were women discharged after delivery, and it is this group of women upon which 1987 estimates of cesarean section rates are based.[3] Data were coded according to the *International Classification of Diseases—Ninth Revision—Clinical Modification*. For this study, the NHDS cesarean section rates were applied to the number of live births from national vital statistics registration data to produce estimates of the number of cesareans. These estimates do not correspond, therefore, to the published number of cesareans from the NHDS data.

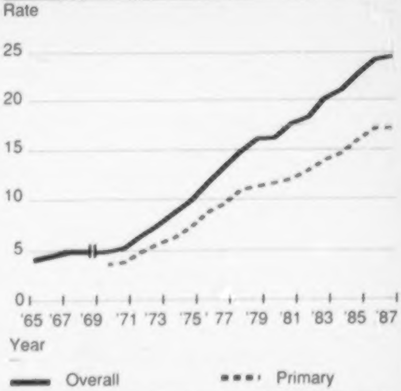
Findings

Between 1970 and 1986, the overall cesarean section rate (the number of cesarean births per 100 deliveries) increased linearly. As can be seen in Figure 1, the overall rate more than quadrupled, rising from 5.5 to 24.1 cesareans per 100 deliveries. In 1987, on the other hand, the cesarean section rate was 24.4 per 100, not significantly higher than the 1986 rate.[4]

If the 1987 cesarean section rate is applied to the number of births for 1987 from vital registration data (3,809,000),[5] we can project that approximately 929,000 liveborn infants were delivered by cesarean section in 1987, compared with about 905,000 in 1986. Although the overall number of live births in 1987 was only about two percent greater than the number of births in 1970, the number of cesarean sections performed in 1987 was four and one-half times as high as in 1970.

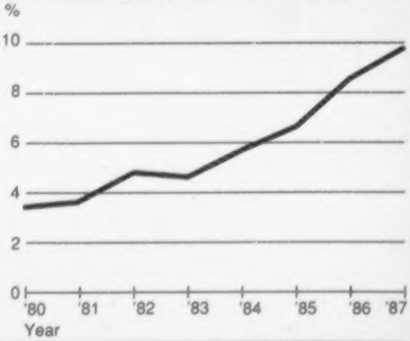
Sixty-five percent of the 929,000 cesarean births in 1987 were primary (i.e., first-time) cesareans, while 35 percent were repeat cesarean sections. As can be seen in Figure 1, the primary cesarean rate (the number of cesarean deliveries per 100 women with no previous cesareans) rose from 4.2 per 100 in 1970 to 17.4 per 100 in 1986. However, the rate for 1987 was exactly the same as that for 1986. This lack of change may reflect a check or even a halt to the steady increase in the primary cesarean rate observed during the 1980s.

Figure 1. Overall cesarean section rate (per 100 births) and primary cearean rate (per 100 women with no previous cesarean), United States, 1965–1987



There was also a slow but steady rise throughout the 1980s in the percentage of

Figure 2. Percentage of women with a cesarean delivery who delivered vaginally in their subsequent birth, 1980–1987



Selma M. Taffel and Paul J. Placek are statisticians with the Division of Vital Statistics and Mary Moien is chief of the Hospital Discharge Survey Branch of the Division of Health Care Statistics, all with the National Center for Health Statistics, Hyattsville, Md.

cesarean deliveries that were repeat procedures (not shown). (This trend was itself a product of the very sharp increase in the primary cesarean section rate during the 1970s among teenagers and women in their 20s.) In 1980, 30 percent of all cesarean sections were repeat procedures; by 1987, this proportion had climbed to 35 percent.

Until recent years, there was little chance that the rate of repeat cesareans would decline, since few physicians were willing to allow a woman who had once had a cesarean delivery to attempt a subsequent vaginal delivery. In 1970, for example, only about two percent of pregnant women who had previously had a cesarean delivery gave birth vaginally.

As can be seen in Figure 2 (page 227), however, the proportion of women who have a vaginal birth after a cesarean section has climbed substantially in the United States. In 1987, an estimated 36,000 women delivered vaginally after having had a previous cesarean section; of all women with a previous cesarean, 9.8 percent gave birth vaginally, while 91.2 percent had a repeat cesarean. In contrast, the rate of vaginal birth after a previous cesarean was 8.5 percent in 1986 and 4.8 percent in 1982. The apparent increase between 1986 and 1987 is not statistically significant, because of the relatively large sampling error involved. (Numerically, vaginal birth after a cesarean remains a relatively rare event.) However, the increase between 1982 and 1987 is statistically significant.

Even the 1987 level of about 10 percent is well below what many practitioners believe to be medically possible. One recent study showed that fewer than half of all hospitals offer women who have had a previous cesarean the option of attempting vaginal delivery, even though the success rate for vaginal delivery following a cesarean in those hospitals that do offer such an option is 51 percent.[6] This suggests that rates of vaginal birth after a cesarean section remain low not because vaginal delivery fails but because it is infrequently tried.

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DIGEST

Many Americans Oppose Government Intervention In Abortion Rights, but Endorse Some Restrictions

The Supreme Court's decision in *Webster v. Reproductive Health Services,* although widely supposed to signal a potential turnaround on abortion by the Court, does not seem to have changed overall support for legal abortion among Americans; indeed, the Supreme Court's action on July 3 appears to have heightened concern about government intervention and state candidates' positions on the issue. According to a series of recent public opinion polls, support for maintaining the legal status of abortion fluctuated between 43 and 49 percent from April to September, but a clear majority of Americans say that they oppose government intervention in abortion decisions (68 percent in July and 69 percent in September). In addition, almost two-thirds of those polled (65 percent in July and 63 percent in September) said that abortion was one of several important issues that would influence their vote in state elections, while only half (52 percent) said so in June, just before the *Webster* decision. A majority of Americans support two restrictions on abortion: parental notification for girls under 18 and tests for fetal viability. However, more than half do not approve of prohibiting public employees or public hospitals from performing abortions or making it harder for private clinics to perform them.

The findings are based on the results of three separate telephone surveys conducted by *The New York Times* and CBS in April,[1] July[2] and September[3] 1989 among persons 18 and older. The first was conducted April 13–16 among 1,412 adults. In the second, conducted July 25–30, 978 adults were randomly selected from respondents to a larger survey of women's issues conducted June 20–25. The last, carried out September 17–20, surveyed 1,347 adults. All the polls had a margin of sampling error of plus or minus three percentage points.

The three surveys show some fluctuation but little overall change in the percentage of respondents who say that abortion should remain legal "as it is now." (The question asked: "Should abortion be legal as it is now, or legal only in such cases as rape, incest, or to save the life of the mother, or should it not be permitted at all?") Support for legal abortion was highest in April this year (49 percent); and, in fact, that was the highest percentage favoring legal abortion in 10 *New York Times* polls since January 1985. This support dropped to 44 percent in June, just before the *Webster* decision, and rose again to 48 percent in July, shortly after *Webster*. In September, however, support again fell to 43 percent. Corresponding changes occurred in the proportion who thought abortion should not be permitted at all: nine percent in April and July, and 13 percent in June and September. During the same period, the proportion who favored permitting abortion only in cases of rape or incest or to save the mother's life remained steady: 39 percent in April and July and 40 percent in June and September. In all the surveys, 3–4 percent of respondents either did not answer or replied that they did not know.

Another question asked: "If a woman wants to have an abortion, and her doctor agrees to it, should she be allowed to have an abortion, or not?" In the April and July polls, 63 percent of respondents said that the woman should be allowed to have an abortion, 24 percent thought she should not be allowed to have the abortion and about 11 percent said it depended on the situation. In September, however, only 58 percent thought that a woman should be permitted to have an abortion if she wanted one and her doctor agreed to it; 26 percent were opposed to her having the abortion and 13 percent said that it depends on the circumstances.

Several questions asked in September had not been included in earlier surveys. For example, 52 percent said that the *Webster* decision had made them more likely to think that abortion is an important right for women, and 66 percent were either very concerned or somewhat concerned about women losing that right. Forty percent said abortion should be available to all who may want it, another 40 percent thought it should be available but more difficult to obtain and 18 percent said it should not be available at all. Forty percent thought their state should use public funds to help pay the costs of abortion for women who cannot afford them, while 46 percent thought it should not. Finally, 45 percent thought that making abortion illegal would reduce the number of abortions, while 46 percent thought it would not.

In the September survey, Americans were more likely to favor than to oppose legal abortion in the following situations: if the mother's life is endangered by the pregnancy (88 percent vs. eight percent), if there is a strong chance of a serious defect in the baby (70 percent vs. 22 percent), if the family has a low income and cannot afford any more children (49 percent vs. 46 percent) and if the woman is not married and does not want to marry the father (48 percent vs. 45 percent). In each of these cases, the percentage of respondents favoring legal abortion was either the same or higher in July and September than in April.

Two other hypothetical situations were included in the July and September surveys: In July, 48 percent favored and 44 percent opposed legal abortion if the pregnancy would force a teenager to drop out of school, while just 37 percent favored and 56 percent opposed legal abortion if the pregnancy would interfere with a professional woman's career. In September, support for legal abortion in the former case remained about the same, 47 vs. 46 percent; in the latter case, however, support dropped to 34 vs. 61 percent.

Despite the wide variation in views regarding the appropriateness of abortion in specific cases, a clear majority of those questioned opposed government intervention in this area. Sixty-eight percent in July and 69 percent in September agreed with the statement, "Even in cases where I might think abortion is the wrong thing to do, I don't think the government has any business preventing a woman from having an abortion."

The *Webster* decision also appeared to heighten voters' concerns about state government candidates' positions on abortion. In June, just six percent of those surveyed thought abortion was the single most important issue when deciding on a particular candidate, 52 percent thought it, along with other issues, was important, and 35 percent said that it would not influence their vote. In July, after the *Webster* decision, the proportions in those categories had changed to nine percent, 65 percent and 20 percent, respectively. In September, abortion remained an important issue for voters: Nine percent said that it was the most important issue and 63 percent considered it one of several important issues, while 23 percent said that it would not influence their vote.

Even so, the *Webster* decision was not well understood by a majority of those surveyed in July. Although 14 percent said they approved of the decision and 23 percent said they did not approve of it, 59 percent said they had not heard enough about it to have an opinion. By September, those who said they did not have a clear understanding of *Webster* had increased to 73 percent.

When asked about four possible restrictions that could be placed on abortion, a majority of the July poll respondents approved of requiring parental consent before a girl younger than 18 could have an abortion (71 percent vs. 23 percent). A majority also agreed that a test to make sure that the fetus is not developed enough to live outside the womb should be required (60 percent vs. 28 percent). In contrast, most of those surveyed opposed prohibiting public employees or public hospitals from performing abortions (57 percent vs. 35 percent) and passing laws that would make it difficult for private clinics to perform abortions (52 percent vs. 41 percent). Responses to these questions in September were virtually the same. However, when the last question was changed to ask whether private clinics should be required to have special equipment and staff like those of hospital operating rooms in order to be licensed, 72 percent agreed.

A substantial number of those surveyed in July and September considered advocates on one or the other side of the abortion debate to be "extremists." Fifty-seven percent of those polled in July and 59 percent of those surveyed in September thought that most of the people who advocate keeping abortion legal are "reasonable people," while 33 percent and 29 percent, respectively, thought they were "extremists." On the other hand, 46 percent in July and 44 percent in September thought that those who advocate making abortion illegal were reasonable, while 44 percent and 42 percent, respectively, thought they were extremists. In September, 74 percent of those polled said that sit-ins staged to block clinic doors and attempts to dissuade women from entering were unacceptable forms of protest.

The July and September surveys also asked whether respondents thought that abortion was the same as murdering a child. Surveys have shown a definite trend away from equating abortion with murder since 1983; in that year, 57 percent did, and 30 percent did not, think it was the same. In July 1989, 40 percent considered abortion the same as murder, and nearly all of those thought so regardless of whether the abortion was performed in the first trimester or later, while 47 percent disagreed. In September, 47 percent thought abortion was the same as murder, and 45 percent did not think so. Interestingly, in July, 40 percent (and in September, 45 percent) of those who considered it the same as murder agreed with the statement, "Abortion is sometimes the best course in a bad situation."—*M. Witwer*

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Wisconsin's Grandparent Liability Law Saved Very Little State Money and Averted Few Teenage Births

Wisconsin's groundbreaking attempt to make the mothers and fathers of teenage parents responsible for financial support—both as a means of reducing the state's welfare burden and as a way of forcing parents to supervise their children's behavior more closely—appears to have been largely unsuccessful. A state-sponsored evaluation of the Grandparent Liability Provision of the 1985 Abortion Prevention and Family Responsibility Act shows that grandparent support was ordered in only a handful of cases.[1] In addition, although slight increases in parent-teenager communication regarding sexual behavior and parental responsibility are attributed to the provision, only about 40 percent of parents and seven percent of teenagers surveyed were familiar with the law and believed that it could apply to them. On the other hand, potentially negative reactions to the law—such as increased parental pressure on pregnant daughters to have abortions or on teenage sons to deny paternity—apparently have not occurred.

Wisconsin's Grandparent Liability Provision was intended to reduce government support of babies born to minors and shift financial responsibility to both maternal and paternal grandparents (after paternity is established), if both parents were younger than 18 and unable to support the baby themselves. Supporters of the provision had also hoped that it would increase communication between parents and teenagers (especially males) about sexual behavior and family responsibility.

An assessment of the number of potential cases was conducted between August 1, 1986, and April 30, 1988, by social service agency workers in 54 counties. Information was collected on 447 births, either to minors applying for Aid to Families with Dependent Children (AFDC) or to minors living within an AFDC household. Of these, only 107 potential grandparent liability cases were referred to district attorneys. Financial support by grandparents was ordered in 13 of these cases. Paternal grandparents were ordered to support the child in six of the cases, and support from maternal grandparents was ordered in eight cases. (Two sets of grandparents were ordered to pay together, and 17 were ordered to pay individually.)

The average monthly support order for these 21 grandparents was $79.81. Each of the 13 minor mothers received an average of $128.92 in monthly payments for her baby, ranging from $12.60 to $400 per month. Payments have lasted from one month to two years, with an average duration of nine months, and they are considered as income. The mother's monthly AFDC grant is then adjusted accordingly.

The main reason cited in the report for the low referral rate was the grandparents' lack of financial resources. About 2,400 minors give birth each year in Wisconsin, and roughly half qualify for AFDC. Of this group, more than two-thirds live in households where the grandparents' income is too low to justify the state's pursuing their support of an infant; many of the maternal grandparents were themselves receiving AFDC. Another factor was that many of the teenage mothers were close to age 18 when they gave birth, and about two-thirds of the fathers were not minors. In addition, grandparent support could not be pursued when the teenage parents married, when paternity was not established, or if the grandparents lived out-of-state, had died or were in jail.

To assess the law's impact on attitudes and behavior, the Wisconsin Department of Health and Social Services surveyed 1,183 students in 10th and 11th grades, 800 parents of teenagers and 86 service providers during the fall of 1987. The teenagers responding to the survey were students in civics, English and history classes selected through a stratified sampling of 15 school districts. The parent survey was mailed to parents of teenagers not participating in the student survey; because of the lower return rate expected from parents, approximately twice as many surveys were mailed to parents as were completed by students. Eight hundred (34.3 percent) parent surveys were returned. The investigators caution that the views of parents who returned the survey may differ from those who did not, thus causing bias in that part of the study.

Despite the media attention given to the law, only about half of the parents and fewer than 20 percent of the students surveyed in 1987 had heard of it. About 40 percent of parents and seven percent of students were able to describe it accurately and to recognize that it could apply to them. Most of the 86 service providers, who were involved in teenage pregnancy prevention, teenage employment, job training or health care, knew about the law, and about half were providing information about it through their educational materials.

Among the teenagers who had heard about the law, about three percent of the teenage girls and five percent of the boys reported having discussed it with their parents, whereas about 10 percent of the parents reported having discussed it with their daughters and 14 percent said they had talked about it with their sons. About nine percent of the girls and three percent of the boys reported that the law had caused them to talk about sexuality or birth control with their parents, while nine percent of the parents said it stimulated a discussion with their daughters and 13 percent said it prompted such a talk with their sons. Fourteen and nine percent of the parents reported that the law had prompted discussion of financial responsibility with their sons or daughters, respectively.

Seventeen percent of teenagers and 25 percent of parents who had heard about the law reported that they had changed their behavior because of it; six percent of parents believed their child's behavior had changed and two percent of teenagers felt their parents' behavior had changed. These changes included more intergenerational discussion of sex or birth control, increased supervision of teenagers, greater efforts by the teenagers or by their parents to help them obtain birth control, and a tendency for teenagers to delay their first sexual encounter or to have sex less often. Some service providers also believed that the law had motivated teenagers to seek birth control, delay sex or decrease the frequency of sexual intercourse.

The law also may have had a small impact on attitudes concerning responsibility for children: Those who had heard of the law were somewhat more likely to say that parents and grandparents should be responsible for supporting children born to teenagers, and less likely to say that welfare should support them. However, parents were more likely to say that paternal grandparents and the parents of the baby should be more responsible for support, and teenagers were somewhat more likely to believe that the welfare department should be more responsible for support.

Concerns about the potential negative effects of the law appear to be unfounded. Almost 40 percent of service providers expected that more parents would encourage their teenage daughters to have abortions, and 25 percent expected fewer parents to encourage their sons to admit paternity. However, the survey responses of the parents and teenagers did not support these expectations.

Although data on birthrates and abortion rates among Wisconsin minors before and after the law are not available, the absolute number of births to unmarried teenagers gradually increased from 1982 through 1987, while the overall percentage of births to teenagers remained relatively stable.[2] Thus, the law appears to have had little impact on teenage childbearing in Wisconsin.

Despite the law's apparent lack of impact, the state is committed to the Grandparent Liability Act for the long term. The scheduled sunset date of December 1989 has been lifted, and several revisions were made in 1988 that may increase the number of eligible cases. One such revision made grandparents' liability retroactive to the date of the baby's birth or to the date when a successful paternity action was filed. (Many paternity actions are not begun until after the baby's birth, and may take from one month to three years to be adjudicated.) Other changes allow grandparents, parents or the child to pursue grandparent support themselves, rather than just social service workers, which may involve more grandparents who do not receive AFDC and should increase the number of potential cases from 10 percent of all minor births to perhaps 20–30 percent. Finally, to increase awareness of the law and to enhance its potential impact on attitudes and responsibility, the state has allocated $25,000 for publicity during the next two years.[3]—*M. Witwer*

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Canada: Early First Birth No Longer Guarantees High Lifetime Fertility

In Canada, the effect of age at first birth on lifetime fertility is declining, as women who begin childbearing early no longer have significantly more children than do those who delay. The decline can be attributed, in part, to widespread use of effective contraceptive methods in general, to the adoption of sterilization by Canadian women (particularly by young women), and to the convergence of the two-child norm across all socioeconomic groups. These are some of the main conclusions to

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emerge from a recently published analysis of birth history data collected in the 1984 Canadian National Fertility Survey (CFS).[1]

Researchers analyzed national fertility data to determine whether age at first birth continues to influence the eventual number of children that a woman will have. Birth history data for 5,315 women aged 18–49 had been collected in the 1984 CFS; for the purposes of the analysis, the researchers restricted the total sample to women aged 25–49 who had either married or had a child before reaching age 25. The final sample of 3,564 women was divided into five age cohorts (25–29, 30–34, 35–39, 40–44 and 45–49), and age at first birth was classified as under 18, 18–19, 20–21, 22–24 or 25 or older.

The investigators calculated cumulative fertility by age at five-year increments—from age 20 through age 45—so the effects of age at first birth could be seen at intermediate points throughout a woman's reproductive life. For women in the younger cohorts, whose childbearing may often have been incomplete at the time of the survey, the investigators used the women's estimates of their expected lifetime fertility. Such estimates are likely to be quite realistic for many of these women if they or their partners are sterilized; the investigators thus also calculated the percentage of women protected by sterilization according to age at first birth. Finally, as early childbearing is strongly associated with socioeconomic factors known to influence family size (such as area of residence, religion, church attendance and education), the researchers used multiple classification analysis to control for these variables, so the independent effects of age at first birth on potential lifetime fertility could be assessed.

The effects of age at first birth on overall fertility are most pronounced among women in the two oldest cohorts (ages 40–44 and 45–49): Those who began childbearing before age 18 had, on average, 2.7 more children than did those who waited until age 25 or later. These lifetime fertility differences were largely decided by age 30. Differences in completed fertility in the next youngest cohort (ages 35–39) declined significantly; women who had a child before age 18 had an average of only 1.7 more births than did those who delayed until at least age 25.

In their analysis of the reproductive behavior of women under 35—who still have many reproductive years ahead—the investigators relied increasingly on estimates of additional children expected. They note that within each of the younger cohorts, the differences in total expected fertility according to age at first birth have systematically decreased. In fact, among 30–34-year-olds, those who first gave birth before age 18 expect to have very few additional children. The total number of births expected among these women differs little from that of their counterparts who first gave birth at ages 22–24 (2.9 vs. 2.3 total expected births—a difference of 0.6 births). The difference is even smaller for women 25–29 years of age: Those whose first birth occurred before age 18 expect to have a total of 2.5 births, just 0.1 more than women who waited until ages 22–24 before having children.

The authors of the study looked at the prevalence of sterilization among these women to determine whether fertility expectations could be considered reliable indicators of fertility outcomes. The high incidence of sterilization in the younger cohorts clearly indicates that these estimates are realistic. The proportion protected by sterilization declines steadily with rising age at first birth, as those who first gave birth at an early age end their childbearing early by choosing sterilization. According to the investigators, a "surprising" 49 percent of women in the youngest cohort who first gave birth before age 18 are protected by sterilization (38 percent by tubal ligation and 11 percent by vasectomy), as are 43 percent of those with a first birth at ages 18–19 and 20–21 and 15 percent of those with a first birth at ages 22–24.

The multiple classification analysis showed that socioeconomic factors had little influence on the association between fertility and age at first birth. After controlling for place of residence, religion, church attendance and education, the researchers found only minor differences between adjusted and unadjusted fertility, suggesting that age at first birth acts on fertility independently of other variables.

Because high proportions of women who begin childbearing early now elect sterilization at a young age, the effect of age at first birth on future fertility has declined appreciably. Although those who start childbearing early still have higher completed fertility than do those who delay, that excess has systematically decreased. The authors claim that the narrowing in fertility differentials by age at first birth can also be attributed to the widespread norm of the two-child family in Canada, to changing nuptiality patterns (e.g., increased levels of separation and divorce among younger women) and to the fact that as a result of increased societal acceptance of early nonmarital births, these no longer necessarily lead to marriage and thus additional fertility. Despite the evidence that the effects of age at first birth on lifetime fertility have declined, the authors warn that "early childbearing may continue to have its costs in forgone education for the mother, higher risk of marital dissolution and negative economic consequences for the couple."—*L. Remez*

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Long-Term Pill Users Shown to Be at Higher Risk of Breast Cancer

A study from Great Britain exploring possible associations between oral contraceptives and breast cancer in young women has shown a trend of increasing risk of breast cancer among women who had used the pill beyond four years.[1] The recently released data join a welter of new studies on the topic of the pill and breast cancer, many of which have produced conflicting findings.[2] The major issue addressed by most of the studies is whether certain subgroups of women, such as those in whom breast cancer occurs at a relative early age, are more vulnerable as a result of oral contraceptive use.

A recent reanalysis of data from a Swedish-Norwegian case-control study that had previously reported total duration of pill use to be a risk factor for premenopausal breast cancer suggests that nulliparous women may be particularly susceptible to breast cancer if they are long-term pill users.[3] U.S. data from the Cancer and Steroid Hormone Study indicate, however, that even long-term use of oral contraceptives does not contribute to breast cancer risk among women who are already susceptible because of a family history of breast cancer.[4]

The British Study

The analysis of pill use and breast cancer risk by the UK National Case-Control Study Group involved women younger than 36 at diagnosis of breast cancer. The women came from 11 health regions in England, Scotland and Wales, and most were diagnosed between January 1, 1982, and December 31, 1985. A list of 1,049 women eligible for the study was compiled from local cancer registries, supplemented by information obtained from hospital registers.

Between January 1984 and February 1988, at-home interviews were conducted with the patients to obtain demographic characteristics, medical histories and details of personal habits such as smoking and drinking. The research hypothesis was not revealed to the women, who were told that they were participating in a general health survey. The interview information was supplemented by information from the records of the women's primary-care physicians. A woman who matched each breast cancer patient's age (within six months) was chosen from among the physician's other patients and was enrolled in the study as a control. Controls were selected only for patients who had been interviewed, and if the first control declined to participate, a second (or subsequent) control was selected using the same procedure.

Of the eligible patients, 755 were interviewed, for a response rate of 72 percent. Three percent of patients refused to be interviewed, three percent had moved out of the study area, 16 percent had died and seven percent were not permitted by their doctor to participate, mainly because they were too ill to be interviewed. The same number of controls were interviewed, 89 percent of whom were the first control selected. In the analysis, relative risks were adjusted for breastfeeding, as well as for such accepted breast cancer risk factors as age at menarche, nulliparity, age at first full-term pregnancy and family history of breast cancer.

Among breast cancer patients, 91 percent had used the pill at some time, compared with 89 percent of controls. A significant trend in risk of breast cancer was found with duration of oral contraceptive use: Women who had used the pill for no more than four years had no increased risk of breast cancer, but by the time women had used the pill for more than eight years, they had a risk of 1.7 relative to never-users; the trend with duration of use was significant at $p<0.001$. The same trend was found regardless of whether women were nulliparous or parous.

Examination of the data among parous women by duration of pill use before and after a first full-term pregnancy showed that using the pill after a first pregnancy increased the relative risk among long-term users over and above the risk associated with pill use before a first pregnancy. While women who had used the pill for more than eight years before a first full-term pregnancy (and who may also have used the pill after that pregnancy) had a risk relative to never-users of 1.4 (trend with duration of use significant at $p<0.05$), those who used the pill for a similar length of time after pregnancy (and who may also have used the pill prior to a first full-term pregnancy) had a relative risk of 2.0 (trend with duration of use significant at $p<0.01$). An association between breast cancer and pill use before a first full-term pregnancy has been reported in other studies, but this study is unique in reporting that pill use after a first full-term pregnancy contributes to breast cancer risk, even among women who had not used oral contraceptives before their first delivery.

The age at which pill use began (18 or younger, 19–21, 22–24 and 25 or older) had no effect upon the duration-of-use patterns established in the previous analyses; that is, in each age-group, there was a trend by duration of use, with the greatest risk existing among those using the pill for more than eight years. Neither did analysis of the data by recency of use (whether the women had taken the pill within three years of diagnosis, within six years, within nine years or within 12 years) have any substantial effect on duration-of-use trends. Examining the effect of a latency period on breast cancer risk by disregarding use within the three years prior to diagnosis, within six years, within nine years and within 12 years was also inconsequential to the patterns already established.

Oral contraceptives with at least 50 mcg of estrogen displayed a duration-of-use trend that was statistically significant ($p<0.001$), with those women who had used the pill for more than eight years having a relative risk compared to never-users of 2.6. The relative risk remained about the same when pill use in the three years prior to diagnosis was disregarded. Few women had used pills with less than 50 mcg of estrogen for more than eight years, and a trend toward increased risk with duration of use was only marginally significant ($p<0.10$). Progestin-only pills are used mainly during breastfeeding, and thus duration of use is short, but the available data indicated a protective effect against breast cancer after 12 months of use. Among women who used the progestin-only pill for more than two years, for example, the risk of breast cancer relative to never-users was 0.6 ($p<0.05$), but the finding is based on very small numbers of cases and controls.

As part of an attempt to evaluate a number of potential problems that can alter research results, such as recall bias, the investigators examined all sources of information on pill use by study participants (the woman's own statement, physicians' records and clinic records). They found that, in terms of time spent on the pill, breast cancer patients may recall 1–2 percent more actual pill use than controls. Physicians' records also indicated that breast cancer patients who were not interviewed had, on average, used oral contraceptives for less time than those women who were interviewed. These data would indicate that studies with a high nonresponse rate among patients may report breast cancer risks that are biased upward.

Patients who used the pill reported practicing breast self-examination no more frequently than did nonusers. Although more patients who used the pill than those who did not had had their breasts examined by a physician (53 percent, compared with 31 percent), less than three percent of the breast lumps were originally discovered by physicians. Some evidence indicates that women who had used the pill were more likely than those who had not to have tumors confined to early stages of the disease (41 percent, compared with 44 percent) and were less likely to have pathological evidence of disease in the axillary nodes (44 percent, compared with 58 percent).

The researchers suggest viewing with caution those results showing that pills containing less than 50 mcg of estrogen may carry a lower risk of breast cancer and that progestin-only pills may even be protective. Low-dose formulations have been on the market for less time than pills containing 50 mcg or more of estrogen, and few women enrolled in the study had used them for long periods. Likewise, few had used progestin-only pills for prolonged periods.

If the increased risks found in this study are accurate, approximately 20 percent of breast cancer cases among women younger than 36 could be attributable to oral contraceptive use. The researchers note that while two breast cancer registries in England and Wales do show an increased incidence of breast cancer among women aged 25–34, the increase began in the early 1960s, too early to be explained by pill use. Whether women who are diagnosed with breast cancer at such an early age are different from the majority of women with breast cancer, who are not diagnosed until much later ages, or whether prolonged use of oral contraceptives at an early age might produce a persistent increase in risk that will continue as these women age is a matter of speculation.

The Swedish-Norwegian Study

Women less than 45 years of age who had had invasive breast cancer diagnosed between May 1984 and May 1985 were enrolled in a Swedish-Norwegian case-control study of the pill. Of the 473 breast cancer patients from the two countries who were eligible, 89 percent were interviewed regarding their demographic characteristics and reproductive and contraceptive histories. Controls (two for each Norwegian patient and one for each Swedish patient) were selected from population registries in both countries and were matched to patients by date of birth. Eighty-one percent of controls were interviewed, and data were analyzed for 422 patients and 722 controls.

An analysis of relative risk of breast cancer by duration of oral contraceptive use before a first full-term pregnancy was adjusted for a family history of breast cancer and a history of breast biopsy. Parous women who had used the pill showed no significant increase in risk of breast cancer relative to never-users, even if they had used the pill for eight or more years. Results were inconsistent among nulliparous women: Those who had used the pill for less than four years had a significant breast cancer risk of 2.8 relative to never-users, those who had used it for 4–7 years had a nonsignificant relative risk of 1.0 and those who had used it for eight years or more had a significant risk of 4.3.

When they examined the data by total duration of pill use, the investigators found that women who had used the pill for 8–11 years, with at least eight years of use prior to a first full-term pregnancy, had a significantly increased risk of breast cancer relative to never-users of 3.4. Women who had used the pill for 12 years or more, all of it after a birth, had a relative risk of 3.0. Further analysis revealed, however, that only the total duration of use made a significant contribution to risk, which increased by 17 percent for every three years of pill use, regardless of whether pill use occurred before or after a first pregnancy.

Since nulliparous women had a higher relative risk after eight years of pill use than parous women had after 12 years, the researchers conclude that "a full-term pregnancy may modify any increased risk possibly induced" by oral contraceptives; their findings also give some support to suggestions that nulliparous women "may be particularly susceptible to long-term exposure to oral contraceptives."

Family History of Breast Cancer

An analysis of oral contraceptive use among women with a family history of breast cancer used data from the Cancer and Steroid Hormone (CASH) Study a population-based case-control research project conducted by the U.S. Centers for Disease Control with support from the National Institute of Child Health and Human Development. The CASH study collected data for two years, beginning in December 1980, on cancers of the breast, ovary and endometrium among women aged 20–54 living in eight geographical areas of the United States. It identified 5,889 women who received a diagnosis of breast cancer, 80 precent of whom participated in at-home interviews.

Controls, selected during the same two-year period in which patients received their diagnosis, were obtained by random telephone dialing of households in the same region as the patient. They were matched to patients by five-year age intervals. Of the 5,698 control women selected, 83 percent were interviewed, also at home, and 108 were then excluded because they had a previous history of breast cancer or they had reached 55 years of age before they were interviewed. The analysis of data compares 4,730 breast cancer patients with 4,646 controls.

Twelve percent of the breast cancer patients had a family history of breast cancer through a first-degree blood relative (mother, sister or daughter), and 16 percent had such a history through a second-degree relative (grandmother or aunt). Comparable figures among controls were six percent and 13 percent. Thirty-nine percent of patients and 47 percent of controls reported no family history of breast cancer, and 33 percent of patients and 34 percent of controls reported no known family history of breast cancer, although information for one or more relatives was incomplete. The data were adjusted for age, age at menarche, age at first-term pregnancy, parity, menopausal status and benign breast disease prior to oral contraceptive use.

No pattern of risk of breast cancer by duration of pill use (divided into two-year intervals with the final category being more than 10 years of use) could be discerned among women with either a first-degree or a second-degree family history of breast cancer. The only statistically significant finding was a decreased risk relative to never-users of the pill of 0.4 among women with a first degree family history of breast cancer who had used the pill for 6–8 years. To determine whether a latency period alters the results, the researchers analyzed only the data for women who had taken the pill for at least four years, by whether they had completed four years of use within four years prior to enrollment in the study, within 5–9 years or within 10 or more years. However, in none of the latency categories did patients with either a first-degree or a second-degree family history of breast cancer have a relative risk that was significantly different from women who had never used oral contraceptives.

An analysis by months of use before a first full-term pregnancy showed only one statistically significant increased relative risk: Women who had a second-degree relative with breast cancer and who had taken the pill for 4–6 years prior to a full-term pregnancy showed a relative risk of 3.1. The relative risks for both shorter and longer periods of use were all in the range of 0.9–1.3 and were not significant. When women who had completed four years of pill use prior to a first full-term pregnancy were analyzed by latency intervals, the results were all nonsignificant.—*J. Johnson*

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Marital Instability Grows: Most Recent Marriages In U.S. Are Likely to Fail

About two-thirds of recent first marriages are likely to end in separation or divorce, according to a new analysis of U.S. data on marital disruption.[1] Furthermore, the instability of marriages begun at ages 20–22 appears to have grown between 1975 and 1985, and second marriages continue to be less stable than first marriages. Although vital statistics data have shown a 10 percent decline in the crude divorce rate during the 1980s, the researchers suggest that this decline may indicate a plateau in the long-term trend rather than a shift toward greater marital stability.

The new study uses data from the June 1985 Current Population Survey (CPS), which, unlike vital statistics, provides detailed exposure-specific measurements and uses separation, not just divorce, as the event terminating marriage, thus measuring all marital disruption. The researchers based their analysis on marital history data for women only because they are of a higher quality than data on men. They studied cohorts married since 1970; during the past 15 years, each annual first-marriage cohort is represented by approximately 1,000 women. Trends were examined from two perspectives: observed disruption within the first five years of marriage for successive marriage cohorts, and period estimates of disruption within 40 years of marriage, based on duration-specific rates.

Among cohorts marrying in the late 1970s and those marrying in the early 1980s, the cumulative proportion of marriages disrupted within five years was 0.22 and 0.23, respectively, for first marriages; 0.24 and 0.27 for second marriages; and 0.20 and 0.38 for third marriages. The rates of lifetime marital disruption are estimated to be 57 percent, 51 percent and 56 percent, according to duration-specific separation rates in 1980, 1982 and 1984, respectively. Previous studies, including the CPS, have been downwardly biased in estimating marital disruption because of underreporting in sample surveys, the researchers say. After adjusting for underreporting, the researchers found that the 56 percent disruption rate estimated for 1984 first marriages from the June 1985 CPS is actually closer to two-thirds (64 percent).

First Marriages

For first marriages, age at marriage is one of the strongest predictors of marital disruption. Women who married as teenagers between 1970 and 1985 were twice as likely to separate as those who married after age 22. Compared with marriages during the teenage years, marriages at ages 20–22 were associated with a 37 percent lower risk of disruption among whites and a 34 percent lower risk among blacks. There was an additional reduction of more than 20 percent in the risk of marital disruption among whites marrying after the age of 22.

The life-tables show an increase of nearly 40 percent over time in the likelihood of marital disruption among women first marrying at ages 20–22, with the percentage of marriages disrupted within five years rising from 14 percent among those married in 1970–1974 to 18 percent in the 1975–1979 marriage cohort and 26 percent in the 1980–1985 cohort. The researchers suggest that the characteristics promoting instability in teenage marriages may now be affecting this age-group as well. Age may predict degree of maturity, competence for marital roles, search time for a marriage partner and emotional, educational and economic resources available, all of which could affect marital stability, they add.

There is also a strong relationship between education and marital stability. Multivariate results for those first married between 1980 and 1985 show that among whites, women who attended college have a 51 percent lower rate of separation than do high school dropouts, while among comparable blacks there is a differential of 60 percent. The likelihood of separation among women with less education appears to have increased over time. For those with less than a high school education, the percentage of marriages dissolved in five years was 21 percent in the 1970–1974 marriage cohort, 29 percent in the 1975–1979 cohort and 33 percent in the 1980–1985 cohort. In contrast, the percentage of disruptions among women with at least some college education remained relatively unchanged—16 percent, 18 percent and 16 percent, respectively, for the same three marriage cohorts.

Another strong predictor of disruption of first marrriages, at least among whites, was beginning the marriage with a child. For all those married since 1970, the rate of marital disruption was 71 percent higher among white women with a premarital birth than among white women with no children. For blacks beginning marriage with a child, the separation rate was only 16 percent higher, suggesting that among whites, this situation may be viewed as more "deviant" and, therefore, more stress-producing.

The researchers note that their data did not reveal how many of these marriages were cases in which the woman had married the father of the child born premaritally. They add that higher separation rates among women marrying with children may reflect strains resulting from the presence of a child, but may also reflect the mothers' greater acceptance of single parenthood.

While divorce rates were once generally higher in the West than in the East, regional differences appear to have narrowed. Among whites first married in the early 1970s, disruption rates were about 50 percent higher in the West than in the rest of the country, after controlling for other factors; by the early 1980s, however, there were no significant regional differences among whites or blacks.

Overall, rates of marital disruption are much higher for blacks than for whites or Hispanics. This trend has been linked to the phenomenon of intergenerational single-parent families and to the disadvantages faced by black males in the labor market. The researchers observe: "In conjunction with markedly lower remarriage rates, the higher disruption rates among blacks [have] reduced the average duration in married life among black women to about one-third of nonwidowed adult years, compared with about two-thirds among white women."

Stability of First vs. Second Marriages

Overall, second marriages are less stable than first marriages, in part because second marriages are selected for those who are willing to consider divorce in the event of marital unhappiness. In addition, second marriages may be characterized by more ambiguous norms and more complex family structure, and they may be selected for those with personalities and interpersonal styles that are less conducive to marital stability.

For the period 1970–1985, second marriages differ from first marriages in age at marriage, education, racial composition and the presence of children. Age at second marriage is considerably higher than age at first marriage (a mean age of 33 years vs. 22 years). As with first marriages, there is an inverse relationship between age at second marriage and marital disruption. In addition, 62 percent of women in second marriages were teenagers when they married for the first time; among women in first marriages, only about one-third (35 percent) married as teenagers. This difference is a consequence of the high dissolution rate for teenage marriages and the higher remarriage rate associated with returning to the marriage market at younger ages, the researchers observe.

Women in second marriages generally have lower levels of education than do those in first marriages, but a higher level of education is still associated with a lower rate of marital disruption. As in first marriages, the effect of education appears to be becoming stronger, since women with less than 12 years of education in the most recent marriage cohort (1980–1985) were twice as likely to have separated within five years of their second marriage as were those married for the second time in 1970–1974.

The effect of race is similar in first and second marriages, with blacks separating at a higher rate than whites or Hispanics. A much smaller proportion of both blacks and Hispanics are in second marriages, however, because blacks are less likely to remarry and because Hispanics are more likely to remain in a first marriage.

The presence of children from a previous relationship is much more common in second marriages than in first marriages (76 percent vs. 12 percent, in this study), and does not influence separation rates nearly as much in second marriages. The researchers report only a 14 percent higher net rate of disruption for those with prior children when age at second marriage is controlled for, and the rate decreases further when age at first marriage is taken into account.

To reduce the problems caused by age, race and marriage cohort interactions in comparing first and second marriages, the researchers pooled data on all marriages to white women occurring between 1980 and 1985. They found that second marriages were 25 percent more likely to be disrupted than were first marriages, but this difference declined to 15 percent when the lower educational level of women in second marriages was taken into account, and disappeared completely when age at first marriage was added.

According to the investigators, there are several reasons why a leveling or slight decline in divorce rates during the 1980s may not indicate a true reversal of the long-term trend in divorce. First, the accelerated divorce rate after 1965 could not continue indefinitely without reaching an upper limit, and period measures would be inflated to the extent that divorce is occurring earlier in marriage. Recent demographic trends also may confound estimates of marital stability that are based only on divorce rates. For example, the marked reduction in marriage rates would tend to make marriages more stable, in part because of the reduced proportion of teenage marriages, which are more likely to end in divorce. In addition, many couples in tenuous relationships who might have married and divorced in previous decades may now be choosing not to marry at all. Finally, as the baby-boom cohort moved through the population, it initially increased and then decreased the proportion of marriages beginning at high-risk ages, as well as the proportion of new marriages, for which the divorce rate is highest.

The researchers observe that the continued high rates of marital disruption are linked to increased equality of opportunity for women and other changes in society and the family. These changes will continue, they say, and rates of marital disruption will likely remain high for a long time. Although there will be period variations associated with economic or attitudinal changes, the researchers conclude, "the diversity in family life created by patterns of divorce and remarriage [is] likely an intrinsic feature of modern family life rather than a temporary aberration."—*M. Witwer*

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British Abortion Practice Is Appraised 21 Years After Its Legalization

The British Abortion Act received royal assent in October of 1967 and went into effect in April 1968; between then and April 1987, nearly three million abortions were performed among residents of England and Wales, and 170,000 were provided to Scottish women. The total annual number of abortions performed in England and Wales rose from 54,900 in 1969 to 174,300 in 1987. Between those two years, the abortion rate increased by over 150 percent, from 5.3 to 14.1 per 1,000 women aged 15–44. The authors of a review of two decades of abortion data observe that although Britain was at the vanguard of modern-day abortion legislation in 1967, it now lags behind other Western developed nations; restrictions that interfere with the ability of women to obtain a first-trimester abortion have not been amended since the original legislation was formulated.[1]

Following passage of the Abortion Act, the number of abortions among residents of England and Wales increased rapidly, from 49,900 in 1969 to 110,600 in 1974. The abortion rate between those two years more than doubled as well, increasing from 5.3 to 11.4 procedures per 1,000 15–44-year-olds. Between 1973 and 1976, however, the total annual number of abortions among residents dropped by almost 9,000, to 101,900. In 1976, the abortion rate decreased to 10.5 per 1,000 women. The authors suggest that the decline may have been due to the introduction of free contraceptive services in 1974. (They also hypothesize that the increase in abortion after 1976 may have been the result of the widespread publicity about the side effects of oral contraceptives.)

In 1969, the pregnancy rate in Great Britain was 105 per 1,000 married women aged 16–44; by 1985, it had fallen to 85. In contrast, the proportion of pregnancies ending in abortion increased from 4.0 per 1,000 to 6.3 per 1,000 between those two years. Among unmarried women aged 16–44, the pregnancy rate fell from 62.6 per 1,000 in 1970 to 47.3 per 1,000 in 1985; the abortion rate in that cohort rose from 9.6 to 22.2 per 1,000 between 1969 and 1985.

The 1984 British abortion rate was 12.8 per 1,000 women aged 15–44. Internationally, this rate is toward the low end of a scale that ranged from 5.6 per 1,000 in the Netherlands in 1984 to 181.0 per 1,000 in the Soviet Union in 1982. The abortion rate in the United States in 1983 was 27.4 per 1,000.

The proportion of abortions performed in the first trimester increased from 66 percent in 1969 to 86 percent in 1987. However, the latter figure is still quite low relative to those for other Western developed countries: By 1977, 91 percent of U.S. abortions were being performed in the first trimester, while by 1980, the proportion was 95 percent in Sweden; in 1983, 97 percent of abortions in Denmark took place in the first 12 weeks of pregnancy.

Although it is impossible to obtain complete data on illegal abortions, there is little doubt that the legalization of the procedure in Great Britain substantially decreased maternal morbidity and mortality resulting from illegal abortions. In 1965, 3,050 women were discharged from hospitals with a diagnosis of sepsis associated with abortion; by 1975, this number had fallen to 710, and by 1982, it was down to 390. (The authors point out that although sepsis may develop after a spontaneous abortion, most cases are the result of an illegal abortion.)

In the 1950s, maternal mortality associated with delivery decreased greatly; as a result, abortion became the major cause of maternal death. However, the proportion of maternal deaths resulting from abortion decreased from 25 percent to seven percent between 1967 and 1977, and the number of recorded deaths associated with abortion decreased from 160 in 1961–1963 to nine in 1982–1984, seven of which in 1982–1984 followed legal abortions.

The National Health Service (NHS) provides free abortions to British citizens. However, in 1987, not quite half of all British women who obtained abortions paid for the procedure. Regional differences in the proportions of women obtaining abortions through the NHS have persisted since 1968. In 1986, 85 percent of abortions in the North were carried out through the NHS, compared with only 19 percent of those in the West Midlands.

A public opinion poll conducted in 1988 revealed that most Britons believe that women should have the right to undergo an abortion during the first few months of pregnancy: Of those polled, 80 percent supported that right, while 15 percent did not and five percent said they did not know or gave no answer. Two-thirds of Catholics thought women should have the right to choose.

The same poll asked whether women should be allowed to have an abortion after 20 weeks of gestation. Seventy-seven percent supported a woman's right to end her pregnancy after 20 weeks if the pregnancy endangered her health; 67 percent, if the child would be physically handicapped; and 71 percent, if the woman had been raped. In a 1988 poll, 80 percent of respondents said that a woman infected with the human immunodeficiency virus should be able to have an abortion after 18 weeks of pregnancy.

For an abortion to be performed in Britain, a woman must obtain the signatures of two doctors. In addition, she often must contend with a variety of obstacles, including inadequate abortion facilities within the NHS. The authors suggest that such a state of affairs "is far from abortion on request." Furthermore, they continue, "the youngest and most vulnerable women . . . are most likely to end up having late abortions because of the difficulties in finding their way through this system." The authors are particularly concerned about the large number of late abortions that are performed, and believe that if these can be reduced, many advocates of reforming the 1967 Abortion Act would be appeased. They go on to say that a "reduction in the need for abortion by improving sex education and provision of contraceptives should be the way forward for the public and the medical profession in the next few years. . . ."—*P. Rind*

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In Latin America, Cervical Cancer Is Strongly Linked to Infection with Human Papillomavirus

Women infected with the human papillomavirus (HPV) are at increased risk for cervical cancer; the risk is also greater for those who have had more than three sexual partners, were 16 years old or less at first intercourse, have never had a Pap smear or have had eight or more live births. Oral contraceptive use and cigarette smoking, however, do not appear to be significant risk factors. These are the major findings of a recent Latin American case-control study of the association between HPV and cervical cancer.[1]

Women newly diagnosed with cervical cancer were enrolled at hospitals in Panama, Costa Rica, Colombia and Mexico.* To be eligible, women had to be between 18 and 69 years of age and had to have resided in the same area as the study site for at least six months. Two age-matched controls were enrolled for each patient. In Colombia and Mexico, both controls were selected from among patients at hospital inpatient services or outpatient clinics. In Panama and Costa Rica, one control was selected from the general population and the second was selected from the hospital that referred the patient. The controls from the community were chosen randomly from census lists of women living in the same county as the patient. The hospital controls were selected randomly from lists of current patients. Women under evaluation for gynecologic or endocrine diseases or diseases related to smoking, those who had had a previous diagnosis of cancer and those who had had a hysterectomy were ineligible as controls.

A total of 766 patients with cervical cancer and 1,532 controls were eligible; 759 patients (99 percent) and 1,467 controls (96 percent) agreed to participate. Of this group, only those with sexual experience (759 patients and 1,430 controls) were included in the final sample. Study participants were interviewed and were then given a pelvic examination, during which cervical-swab specimens were taken for analysis of the DNA of HPV.

Viral DNA was detected in 62 percent of the patients and 32 percent of the controls. Infection with HPV 16 or HPV 18 was found to be highly associated with cervical cancer. Once the data were adjusted for the woman's age, number of partners, age at first intercourse, number of live births, interval since last Pap smear and number of years of education, the relative risk ranged from 2.1 for women whose test reactions were the weakest (indicating the presence of less HPV DNA) to 9.1 for women with the strongest test reactions. Infection with two other types of papillomavirus, HPV 6 or HPV 11, was less strongly associated with the risk of cervical cancer, with 17 percent of patients and seven percent of controls testing positive. The highest risks were observed among those who were positive for both HPV 16 or 18 and HPV 6 or 11.

Women with four or more lifetime sexual partners had a 1.6 times greater cancer risk than women with one partner; those who had first had intercourse before age 17; those who had never had a Pap smear and those who had had eight or more children all had elevated risks of cervical cancer (relative risks of 2.1, 3.0 and 1.4, respectively). After adjusting for these potentially confounding factors, the researchers found that smoking, oral contraceptive use and limited education were not significant risk factors for cervical cancer. Furthermore, no relationship was found between any of the risk factors and the presence of HPV DNA. Although it has been assumed that most genital HPVs are sexually transmitted, the lack of association between sexual behavior and HPV infection suggests that this may not always be the case.

The researchers note that the 32 percent rate of HPV 16 or 18 found among the study controls was higher than rates reported in other large population-based surveys that have used the same testing technique: 2–13 percent among women in Germany, and 6–13 percent among women in Denmark and Greenland. The inclusion in the control sample of women with cervical abnormalities could account for some of this discrepancy. The higher rates observed could also reflect a greater prevalence of HPV infection among Latin American women, who are at exceptionally high risk of cervical cancer. The investigators conclude that their findings provide "circumstantial evidence for the hypothesis that HPV is an etiologic agent of cervical cancer."—*F. Althaus*

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*The hospital in Panama represented the entire country; the three hospitals in Costa Rica represented the entire country; the hospital in Bogotá, Colombia, represented only medically indigent patients in that city; and the Mexico City hospital represented patients with social security coverage in that city.

DIGEST

Americans Are Initiating Childbearing Earlier, Census Data Reveal

From 1940 to 1980, women's childbearing became increasingly concentrated between ages 20 and 29; by 1980, two-thirds of all children five years of age or younger had been born to women in that age-group. Meanwhile, the proportion of children born to women who were 35 or older fell sharply. The percentage of white children born to teenage mothers changed very little during the entire period, while the proportion of black children born to mothers younger than 20 increased rapidly between 1960 and 1980. These are some of the findings from an analysis of parent-child age differences drawing on census data from 1940 through 1980.[1]

The sample for each census year was restricted to black and white children five years of age or less who were living with one or both parents at the time of the census. Thus, information is available for five birth cohorts of children, starting with those born between 1934 and 1939 (the 1940 census) and ending with those born between 1974 and 1979 (the 1980 census). Children in institutions and those who were not related to the head of the household in which they lived were excluded from the sample.

The mean age at childbirth of mothers and fathers of both races decreased between 1940 and 1980. Mothers of white preschool children were two years younger in 1980 than in 1940, on average, and fathers were three years younger. The mean age of black parents of preschoolers also declined substantially, with mothers being three years younger and fathers being four years younger in 1980 than in 1940.

The age difference between mothers and fathers of children in two-parent families has decreased with each decade. Although the fathers of white preschool children were four years older than the mothers in 1940, this differential decreased to three years by 1980; among blacks, it decreased from five years in 1940 to three years in 1980.

There was a sharp decline between 1940 and 1980 in the proportion of white children born to older mothers. Nearly 17 percent of the earliest cohort of preschoolers had been born to women who were 35 or older; in the most recent cohort, only six percent of the children had mothers in this age-group. The proportion of preschoolers born to women aged 20–29 increased by 20 percent, and the proportion born to teenagers rose slightly. These changes in distribution resulted, in part, from a decrease in higher parity births among older women.

The proportion of white preschoolers with older fathers also declined steadily. In 1940, 33 percent of these children had fathers who were 35 or older when they were born, compared with only 14 percent in 1980. On the other hand, the proportion of preschoolers who had been born to fathers aged 20–29 increased steadily, from 43 percent in 1940 to 59 percent in 1980. Although the proportion of white children born when their fathers were under 20 more than doubled between 1940 and 1980, it was still less than three percent.

Black parents differed substantially from white parents. In every census cohort, the proportion of children born to mothers under 20 and the proportion born to mothers 35 or older was greater among blacks than among whites. Furthermore, the difference in the proportions of black and white preschoolers who had been born to mothers under 20 increased between 1960 and 1980. After dropping from 16 percent in 1940 to 11 percent in 1960, the proportion of black children born to teenage mothers rose to 21 percent in 1980. In contrast, the comparable proportions of white children hovered between six percent and nine percent between 1940 and 1980. As was the case for white children, the proportion of black preschoolers born to women 35 or older declined steadily between 1940 and 1980, from 21 percent to eight percent. The proportion of black children born to women aged 20–29 rose by 25 percent during the same period, an increase greater than that among whites.

There is much less information available about the fathers of black children: Between 1940 and 1980, the proportion of black preschoolers who were living with their fathers decreased from 88 percent to 54 percent. The proportion whose fathers were 35 or older at the time of their birth declined steeply, from 37 percent in 1940 to 18 percent in 1980. The proportion of preschoolers living with fathers who were 19 or younger when they were born did not change, however.

The researchers point out that evidence linking teenage childbearing to adverse, pervasive and long-lasting social and economic consequences for adolescent mothers and fathers has accumulated in recent years, and that children born to these parents are also likely to suffer adverse effects. The consequences of having older parents, however, are less clear. Although children born to older parents are more likely to live in a relatively advantaged home, such parents may also have less energy and may be less flexible than younger parents. Moreover, the characteristics of the families of older parents have changed over time: In 1940, over 42 percent of the white children born to mothers 35 or older had at least four older siblings. For these children, the advantages of having older parents may have been nullified by the disadvantage of having to share the family resources with a large number of siblings. In 1980, on the other hand, only 13 percent of children born to older mothers had as many as four older siblings. The authors conclude that "if benefits to children of having older parents are contingent upon also having few siblings, . . . then the decline in the proportion of children with older parents has not been an adverse trend."—*F. Althaus*

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Poor LA Women Prefer Private FP Providers Over Subsidized Clinics

A majority of low-income women living in Los Angeles County rely on private sources—mainly private physicians—rather than on subsidized clinics for family planning services. Rates of clinic use vary with the race and ethnicity of the client: Low-income Hispanic women are more than twice as likely to use subsidized clinics as compared with low-income black or white women. The factor that most influences choice of care is health insurance coverage, not poverty level, according to a recently published study that examined sources of family planning care and the degree of satisfaction with that care among poor Los Angeles women.[1]

Data from the 1976 cycle of the National Survey of Family Growth indicated that many poor women do not use subsidized clinics. In response to this finding, investigators from the University of Southern California designed a survey to determine the factors that influence the choice of care among low-income women. Households were selected using census tracts of poor neighborhoods in Los Angeles County, and eligible women—those aged 18–44 or those under 18 if they were married or cohabiting—were interviewed at home. A preliminary screening technique was used so that the final study sample of 454 women would contain an equal number of blacks, whites and Hispanics, as well as an equal representation of women with incomes below the poverty level, at 100–150 percent of the poverty level and at more than 150 percent of the poverty level. During the interview, respondents answered questions on their health insurance coverage and on various characteristics of the family planning care they had received, including objective and subjective measures of patient satisfaction, education, access to care and cost. To be eligible for the survey, participants had to have gone to a doctor or a clinic for family planning care within the three years preceding the interview; in all, 80 percent had made a family planning visit in the past year.

Overall, just 26 percent of the respondents said they were using subsidized family planning clinics, while 16 percent went to private clinics, 19 percent belonged to Health Maintenance Organizations (HMOs) and 36 percent relied on private physicians. An additional five percent reported using family planning facilities in other states or in Mexico. This pattern of use varied little by level of poverty, but there were wide differences according to race or ethnicity: Forty-two percent of Hispanics said they attended subsidized clinics, compared with 18 percent of non-Hispanic whites and 12 percent of blacks. Moreover, among Hispanics relying on subsidized family planning clinics, 65 percent are below poverty, while among black public clinic users, only 10 percent live below the poverty level.

Poor women using subsidized clinics are far more likely to be uninsured than their counterparts who use private sources. Over two-thirds of patients at subsidized clinics had neither private nor public insurance, compared with half of those attending a private clinic and one-quarter of those who saw a private physician for family planning services. The investigators found that Hispanics were substantially more likely than either blacks or whites to be uninsured (52 percent vs. 29 percent and 27 percent, respectively), another factor that reinforces the higher rate of public clinic use among these women. In the related area of cost to the patient, 72 percent of clinic patients had to pay out-of-pocket expenses, compared with only 45 percent of patients seeing private physicians; however, the actual cost of a private physician's care is nearly double that of a subsidized clinic.

The survey also collected information on a variety of satisfaction measures for all four types of providers. Overall, fully one-third of patients of subsidized clinics said they would prefer to have a different source of care, compared with roughly one-quarter of HMO patients and one-sixth of patients either seeing a private physician or attending a private clinic. Compared with patients of private physicians or HMOs, patients of public clinics were more likely to feel uncomfortable and embarrassed during their medical examination. For example, 46 percent of patients at subsidized clinics said they felt embarrassed during their last examination while the comparable proportions among patients attending an HMO and a private physician's office were 23 percent and 26 percent, respectively.

On the other hand, for each contraceptive method, clinic patients (both public and private) were more likely to have had their contraceptive method explained to them—75–79 percent said that the provider had explained the pill or the IUD, compared with 52–59 percent of patients who received care at an HMO or through a private physician. And while 32–33 percent of patients of an HMO or a private physician had had no method explained to them, 17 percent of clinic patients said that no method had been explained to them during their family planning visit. High rates of agreement among subsidized clinic patients concerning long waiting times and crowdedness revealed a low level of satisfaction: Clinic patients claimed that their waiting time averaged over 90 minutes, while private patients and those on prepaid plans said they wait just over 30 minutes for their appointment.

The researchers claim that although use of subsidized clinics is associated with not having a regular source for medical care, the single most important factor related to reliance on public clinics is inadequate or nonexistent health insurance (including Medicaid). Since Hispanics in the sample are most likely to be uninsured, subsidized clinics accounted for the largest proportion of their family planning care. The investigators hypothesize that low levels of patient satisfaction associated with subsidized clinics influence poor women to seek out private care whenever they do have insurance coverage. Further, although the survey obtained data from one urban area only, the investigators conclude that their findings "reinforce the importance of nonfinancial factors in determining levels of clinic utilization by low-income women, and point to specific areas (e.g., patient scheduling)" in which improvements could be expected to increase patient utilization and satisfaction.

A related editorial published along with the above study cites the survey as evidence for the urgent need to reauthorize Title X legislation to provide high-quality services to poor women and men.[2] The author asserts that subsidized clinics must be improved if they are to handle the increasing numbers of uninsured women for whom clinics are the sole source of preventive medical screening and care, and argues that poor clients cannot be blamed for wanting to use private sources when subsidized clinics have excessively long waiting times, less personalized care and unrealistic fee structures.—*L. Remez*

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Books in Review

Policy Approaches to the Mother-Only Family

Mothers Alone: Strategies for a Time of Change

by Sheila B. Kamerman and Alfred J. Kahn, Auburn House Publishing Company, Dover, Mass., 1988, $26.95, 239 pp.

Reviewed by Greg J. Duncan

The last two decades have seen profound changes in the family and in the work lives of American mothers. The number of mothers raising children without the father present in the household has more than doubled, leading some authorities to predict that more than half of today's children will spend a portion of their childhood in a mother-only family. In addition, employment has become so pervasive among women that now, even a majority of mothers with children younger than one year have jobs outside the home.

In *Mothers Alone: Strategies for a Time of Change,* Sheila Kamerman and Alfred Kahn explore how these two trends have produced dramatic changes in the economic environment in which children are raised and in the policy environment in which assistance might be extended to mother-only families. They seek to "choose among the options presented, to seek a constructive, informed societal attitude, a stance, a policy with regard to mother-only families, and to identify the programs that could implement such a perspective" [p. xiii]. In so doing, they draw extensively from their own past policy studies of child care, as well as from employment policies toward women and European approaches to income transfers; they also provide a timely review of the work of other researchers. The result is a useful synthesis of past work, of special interest for those new to the field.

Abundant research in the last two decades has shown, above all, that there is no single model of the mother-only family and, therefore, no single set of policies that could possibly be an across-the-board solution to the economic problems of single-parent families. The majority of women heading mother-only families are divorced, have worked at some time in the past and may well remarry within a few years. This group would benefit most from transitory financial aid and assistance while reentering the labor market.

Never-married women are the next most populous group, comprising two very different categories. Some never married mothers are self-sufficient and not of much concern to policymakers; these are older women who became mothers in their 30s after establishing their careers. Other never-married mothers are among the most problematic: those who became mothers as teenagers, often repeating the experiences of their own mothers. For this group, simple income support programs such as Aid to Families with Dependent Children (AFDC) have clearly proven to be insufficient policy measures.

Based on the official U.S. poverty level, three in five children living in mother-only families are classified as poor. The economic deprivation of mother-only families is even worse relative to the standard of living enjoyed by many married-couple families, increasingly buoyed by incomes from two rather than one earner. Despite its higher overall standard of living, the United States has a rate of poverty among children much higher than that in Canada or Western Europe, a situation partly attributable to the prevalence of mother-only households.

Government income-transfer and labor-market policies, shaped during the Great Depression and created to address work-related problems in stable two-parent families, have proved inadequate in solving the economic problems of mother-only families. Whether welfare-reform legislation passed in 1988 will improve the situation remains to be seen. At a time when a majority of mothers—even those with very small children—are working at least part-time, it is no longer taken for granted that income support programs should be designed to enable mothers to stay home and care for their children. Indeed, most policy debates assume the need for some kind of job training or "workfare" programs and focus on their design.

The authors of *Mothers Alone* outline three policy approaches and illustrate, using their international research, how each has fared. A first option is to support poor mothers at home, in some cases making special provisions for single-parent families. Norway has a very generous program of this kind, predicated on the assumption that women heading mother-only families should be allowed to raise children without having to work outside the home. The authors view this approach as a failure, for two reasons. Supporting mothers at home for extended periods makes them less marketable in the workplace later, when their children are grown. Moreover, even a generous transfer system alone cannot come close to keeping pace with living standards set by two-earner, two-parent families. Even if such transfers (as in Norway) remove the threat of real poverty, they still produce relative deprivation. The authors conclude from this evidence that supporting poor mothers at home is detrimental in the long run, because of their low living standards and the social and psychological problems that result from their stigmatized status [p. 101].

A second approach, appearing in various forms in France and several other European countries, is to support all children (regardless of economic circumstances)

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through universal programs like child allowance, maternity leave and publicly subsidized or provided child care. Universality removes any stigma, but increases costs; child allowances in France require a nine percent payroll tax. Here, as elsewhere in the book, costs are viewed in a rather cavalier fashion; the authors generally endorse these kinds of universal programs.

A third approach, developed in Sweden and also viewed favorably by the authors, combines income support with a very active labor-market policy, which consists of training programs, wage equalization and child care. The result is a very high rate of employment among women heading mother-only families and very little poverty (although mother-only families are still much worse off than two-parent families). Unfortunately, only a few steps (e.g., legislating the right to a short workday until a child is eight) have been taken to combat the enormous time pressures faced by these working mothers.

In drawing lessons for policies on mother-only families that would be in line with the social and political fabric of the United States, the authors argue strongly for viewing employment outside the home as central. Income from work has proved to be much more effective than income transfers in keeping mother-only families out of poverty; it is consistent with societal norms, and, after the age of one, it does not appear to have an adverse effect on a child's development.

Following their premise that employment should be central to any welfare-type program, the authors advise converting the current AFDC system of perpetual and, in many states, paltry cash payments into one of transitional payments only. If satisfactory day care and employment options were in fact available, they would recommend a transitional period of two years at most. More important elements, they say, are comprehensive training and job search programs that would begin when the youngest child has reached his first birthday, public-sector work obligations for recipients unable to find jobs in the private sector and a hard line in dealing with uncooperative participants.

Other suggested policy initiatives aimed at facilitating work (and not restricted to mother-only families) include a school-based preschool program beginning at age three; better child-care options for parents of younger children; several years of job-protected—and, for a shorter duration, paid—maternity leave; wage supplements like the Earned Income Tax Credit; and counseling and other services to address the time pressures faced by working parents and the social isolation experienced by single parents.

The authors also advocate policies that are not directly related to work, including vigorous child support enforcement coupled with a government-guaranteed minimum benefit as insurance for the mother and child against nonpayment of the support. They also recommend universal health insurance and income-based housing allowances. Finally, they propose a specific set of education and counseling programs that focus on teenage pregnancy prevention—to address the problem of mother-only families headed by women who had their first births as teenagers.

Mothers Alone succeeds in its goals of distilling the facts central to the policy debate over single-parent families, documenting the failures of current policy and making a cogent case for new approaches that require employment and provide benefits for all families with children. A major flaw, however, is the authors' failure to discuss the budgetary implications of their recommendations. Indeed, the only real reference to costs appears on the final page when it is acknowledged that "legislators . . . and taxpayers will recoil at probable costs" [p. 228].

One of the most unfortunate legacies of the Reagan presidency is a political climate in which substantial initiatives of the kind proposed in this book are not possible. One hopes for a relaxation of these constraints so that progress again can be made against childhood poverty. In the meantime, crucial questions, unaddressed in the book, must be asked about priorities. Which are the most important of the book's recommendations? Which are best implemented in combination with others? In which cases is there a minimum scale of operation below which action is inadvisable? What would be the most effective way of spending an additional $10–$50 billion, if it were made available?

Precise answers to these questions, of course, cannot be given, but some guidance is vital to future policy discussions. The authors also fail to examine innovative ideas about revenue initiatives that might be used to finance these proposals. *Mothers Alone* amply documents the need for substantial new programs to help mother-only families and other families with economic disadvantages. It is time now to develop feasible strategies for implementing such programs.

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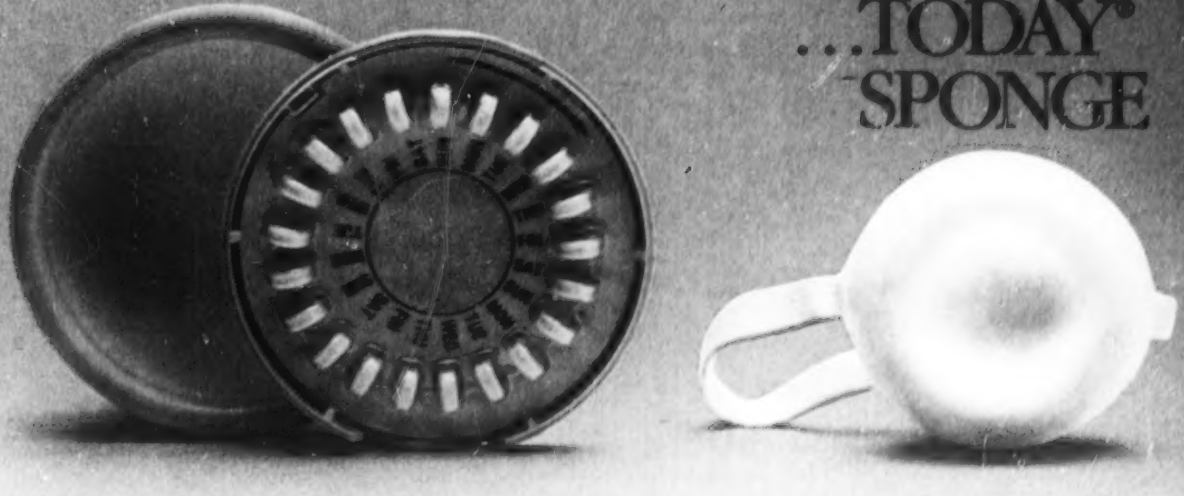

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REFERENCES: 1. McClure DA, Edelman DA: Worldwide method effectiveness of the Today® vaginal contraceptive sponge. *Adv Contracept* 1:305-311, 1985. 2. *Today® Vaginal Contraceptive Sponge: A Technical Review.* Irvine, Calif: VLI Corporation, 1986.

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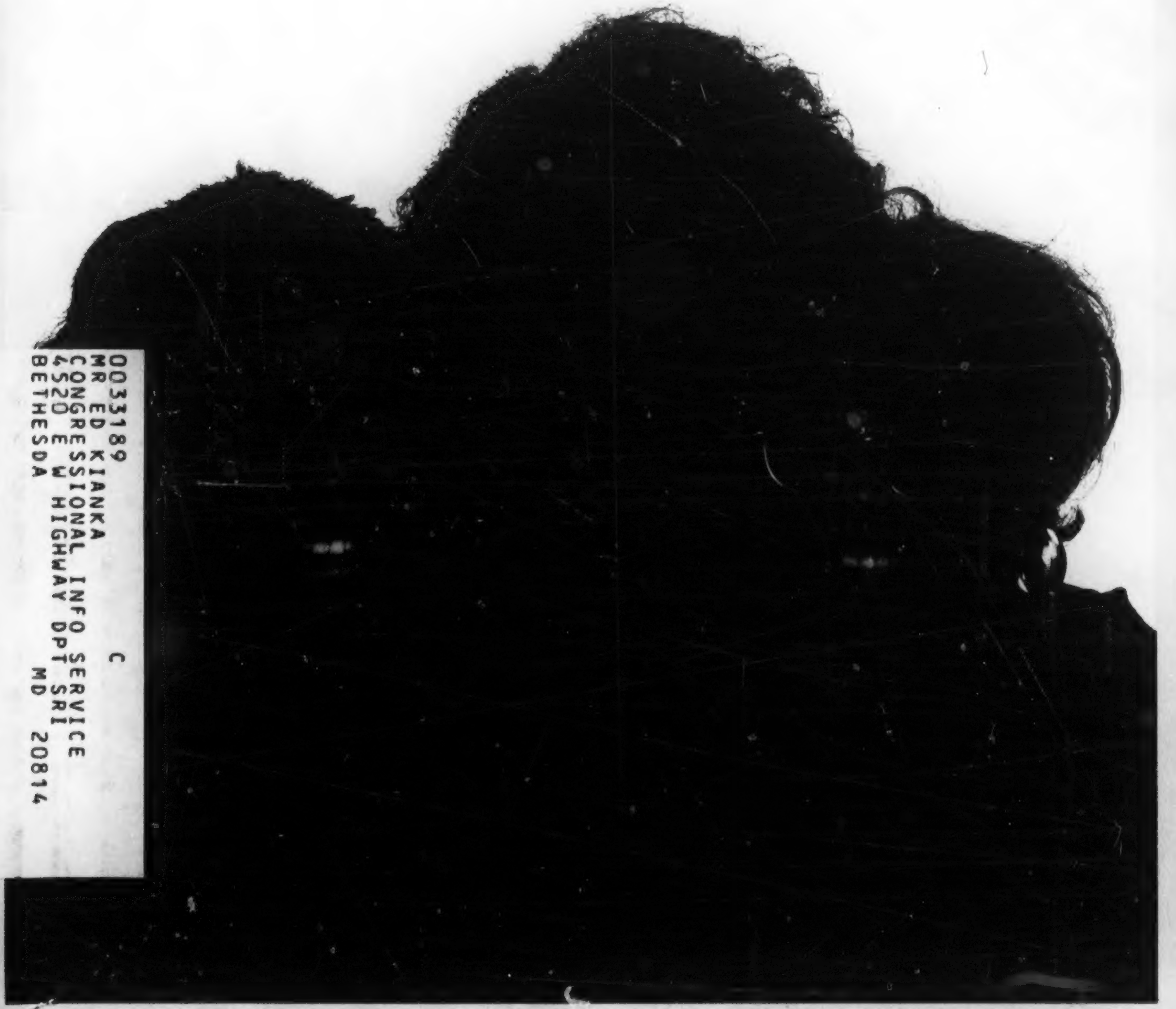
Family Planning Perspectives

Volume 21, Number 6, November/December 1989

Teenage Sex in Rural Communities
Children in Single-Parent Families
Looking at Pill Use Over Age 35
When Urban Adolescents Choose Abortion



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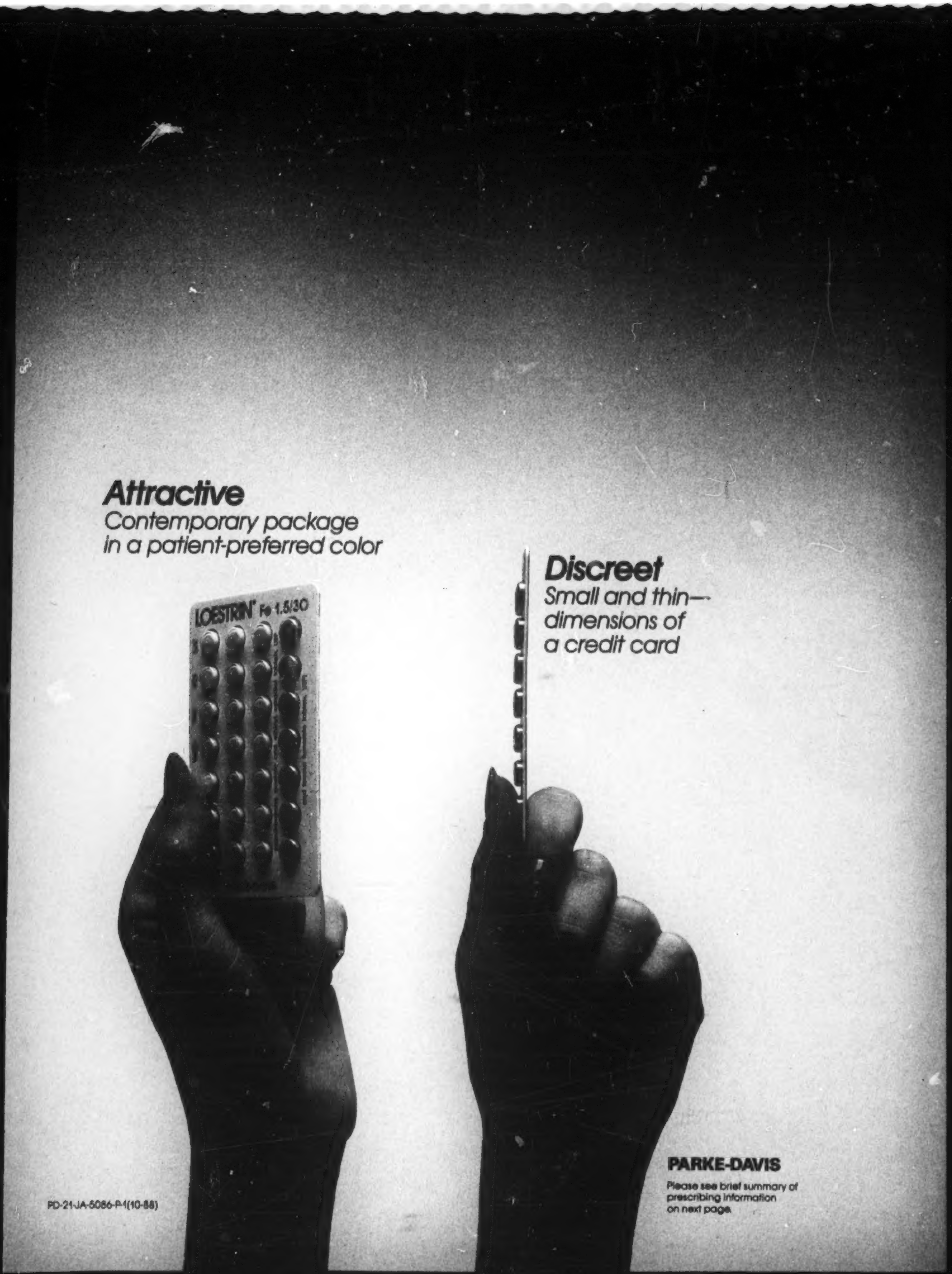
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Please see brief summary of prescribing information on next page.

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LOESTRIN® Fe
(Norethindrone Acetate and Ethinyl Estradiol Tablets, USP and Ferrous Fumarate Tablets, USP)

Before prescribing, please see full prescribing information. A Brief Summary follows:
INDICATIONS AND USAGE: Loestrin 21 and Loestrin Fe are indicated for the prevention of pregnancy in women who elect to use oral contraceptives (OCs) as a method of contraception. **Dose-Related Risk of Thromboembolism from Oral Contraceptives:** Two studies have shown a positive association between the dose of estrogens in oral contraceptives and the risk of thromboembolism. For this reason, it is prudent and in keeping with good principles of therapeutics to minimize exposure to estrogen. The OC product prescribed for any given patient should be that product which contains the least amount of estrogen that is compatible with an acceptable pregnancy rate and patient acceptance. It is recommended that new acceptors of OCs be started on preparations containing 0.05 mg or less of estrogen. **CONTRAINDICATIONS:** OCs should not be used in women with any of the following conditions: 1. Thrombophlebitis or thromboembolic disorders; 2. A past history of deep vein thrombophlebitis or thromboembolic disorders; 3. Cerebral vascular or coronary artery disease; 4. Known or suspected carcinoma of the breast; 5. Known or suspected estrogen-dependent neoplasia; 6. Undiagnosed abnormal genital bleeding; 7. Known or suspected pregnancy (see Warning No. 5); 8. Benign or malignant liver tumor which developed during the use of oral contraceptives or other estrogen-containing products.

WARNINGS

Cigarette smoking increases the risk of serious cardiovascular side effects from oral contraceptive use. This risk increases with age and with heavy smoking (15 or more cigarettes per day) and is quite marked in women over 35 years of age. Women who use oral contraceptives should be strongly advised not to smoke.

The use of oral contraceptives is associated with increased risk of several serious conditions including thromboembolism, stroke, myocardial infarction, hepatic adenoma, gallbladder disease, and hypertension. Practitioners prescribing oral contraceptives should be familiar with the following information relating to these risks.

1. *Thromboembolic Disorders and Other Vascular Problems:* An increased risk of thromboembolic and thrombotic disease associated with the use of OCs is well established. Three principal studies in Great Britain and three in the United States have demonstrated an increased risk of fatal and nonfatal venous thromboembolism and stroke, both hemorrhagic and thrombotic. These studies estimate that users of OCs are 4 to 11 times more likely than nonusers to develop these diseases without evident cause. **Cerebrovascular Disorders:** In a collaborative American study of cerebrovascular disorders in women with and without predisposing causes, it was estimated that the risk of hemorrhagic stroke was 2.0 times greater in users than in nonusers and the risk of thrombotic stroke was 4 to 9.5 times greater in users than in nonusers. **Myocardial Infarction:** An increased risk of myocardial infarction associated with the use of OCs has been reported, confirming a previously suspected association. These studies, conducted in the United Kingdom, found, as expected, that the greater the number of underlying risk factors for coronary artery disease (cigarette smoking, hypertension, hypercholesterolemia, obesity, diabetes, history of preeclamptic toxemia), the higher the risk of developing myocardial infarction, regardless of whether the patient was an OC user or not. OCs, however, were found to be a clear additional risk factor. In terms of relative risk, it has been estimated that OC users who do not smoke (smoking is considered a major predisposing condition to myocardial infarction) are about twice as likely to have a fatal myocardial infarction as nonusers who do not smoke. OC users who are also smokers have about a 5-fold increased risk of fatal infarction compared to users who do not smoke, but about a 10- to 12-fold increased risk compared to nonusers who do not smoke. Furthermore, the amount of smoking is also an important factor. In determining the importance of these relative risks, however, the baseline rates for various age groups must be given serious consideration. The importance of other predisposing conditions mentioned above in determining relative and absolute risks has not as yet been quantified; it is quite likely that the same synergistic action exists, but perhaps to a lesser extent. **Risk of Dose:** In an analysis of data derived from several national adverse reaction reporting systems, British investigators concluded that the risk of thromboembolism, including coronary thrombosis, is directly related to the dose of estrogen used in oral contraceptives. Preparations containing 100 mcg or more of estrogen were associated with a higher risk of thromboembolism than those containing 50 to 80 mcg of estrogen. Their analysis did suggest, however, that the quantity of estrogen may not be the sole factor involved. This finding has been confirmed in the United States. Careful epidemiological studies to determine the degree of thromboembolic risk associated with progestogen-only OCs have not been performed. Cases of thromboembolic disease have been reported in women using these products, and they should not be presumed to be free of excess risk. **Persistence of Risk:** In confirmation of earlier reports, two studies have suggested that an increased risk may persist for as long as 6 years after discontinuation of oral contraceptive use for cerebrovascular disease and 9 years for myocardial infarction. In addition, a prospective study suggested the persistence of risk for subarachnoid hemorrhage. **Estimate of Excess Mortality from Circulatory Diseases:** A large prospective study carried out in the U.K. estimated the mortality rate per 100,000 women per year from diseases of the circulatory system for users and nonusers of OCs according to age, smoking habits, and duration of use. The overall excess death rate annually from circulatory diseases for OC users was estimated to be 20 per 100,000 (ages 15 to 34 – 5/100,000; ages 35 to 44 – 33/100,000; ages 45 to 49 – 140/100,000), the risk being concentrated in older women, in those with a long duration of use, and in cigarette smokers. It was not possible, however, to examine the interrelationships of age, smoking, and duration of use, nor to compare the effects of continuous versus intermittent use. Although the study showed a 10-fold increase in death due to circulatory diseases in users for 5 or more years, all of these deaths occurred in women 35 or older. Until larger numbers of women under 35 with continuous use for 5 or more years are available, it is not possible to assess the magnitude of the relative risk for this younger age group. The available data from a variety of sources have been analyzed to estimate the risk of death associated with various methods of contraception. The estimates of risk of death for each method include the combined risk of the contraceptive method (eg, thromboembolic and thrombotic disease in the case of oral contraceptives) plus the risk attributable to pregnancy or abortion in the event of method failure. This latter risk varies with the effectiveness of the contraceptive method. The study concluded that the mortality associated with all methods of birth control is low and below that associated with childbirth, with the exception of OCs in women over 40 who smoke. (The rates given for pill only/smokers for each age group are for smokers as a class. For "heavy" smokers [more than 15 cigarettes a day] the rates given would be about double, for "light" smokers [less than 15 cigarettes a day] about 50 percent.) The lowest mortality is associated with the condom or diaphragm backed up by early abortion. The risk of thromboembolic and thrombotic disease associated with OCs increases with age after approximately age 30 and, for myocardial infarction, is further increased by hypertension, hypercholesterolemia, obesity, diabetes, or history of preeclamptic toxemia and especially by cigarette smoking. The physician and the patient should be alert to the earliest manifestations of thromboembolic and thrombotic disorders (eg, thrombophlebitis, pulmonary embolism, cerebrovascular insufficiency, coronary occlusion, retinal thrombosis, and mesenteric thrombosis). Should any of these occur or be suspected, the drug should be discontinued immediately. A four- to six-fold increased risk of postsurgery thromboembolic complications has been reported in OC users. If feasible, OCs should be discontinued at least 4 weeks before surgery of a type associated with an increased risk of thromboembolism or prolonged immobilization. 2. *Ocular Lesions:* There have been reports of neuro-ocular lesions, such as optic neuritis or retinal thrombosis, associated with the use of OCs. Discontinue OC medication if there is unexplained, sudden or gradual, partial or complete loss of vision; onset of proptosis or diplopia; papilledema; or retinal vascular lesions, and institute appropriate diagnostic and therapeutic measures. 3. *Carcinoma:* Long-term continuous administration of either natural or synthetic estrogen in certain animal species increases the frequency of carcinoma of the breast, cervix, vagina, and liver. Certain synthetic progestogens, none currently contained in OCs, have been noted to increase the incidence of mammary nodules, benign and malignant, in dogs. In humans, three case control studies have reported an increased risk of endometrial carcinoma associated with the prolonged use of exogenous estrogen in postmenopausal women. One publication reported on the first 21 cases submitted by physicians to a registry of cases of adenocarcinoma of the endometrium in women under 40 on OCs. Of the cases found in women without predisposing risk factors for adenocarcinoma of the endometrium (eg, irregular bleeding at the time OCs were first given, polycystic ovaries), nearly all occurred in women who had used a sequential OC. These products are no longer marketed. No evidence has been reported suggesting an increased risk of endometrial cancer in users of conventional-combination or progestogen-only OCs. Several studies have found no increase in breast cancer in women taking OCs or estrogens. One study, however, while also noting no overall increased risk of breast cancer in women treated with OCs, found an excess risk in the subgroups of OC users with documented benign breast disease. A reduced occurrence of benign breast tumors in users of OCs has been well-documented. In summary, there is at present no confirmed evidence from human studies of an increased risk of cancer associated with OCs. Close clinical surveillance of all women taking OCs is, nevertheless, essential. In all cases of undiagnosed persistent or recurrent abnormal vaginal bleeding, appropriate diagnostic measures should be taken to rule out malignancy. Women with a strong family history of breast cancer or who have breast nodules, fibrocystic disease, or abnormal mammograms should be monitored with particular care if they elect to use OCs instead of other methods of contraception. 4. *Hepatic Tumors:* Benign hepatic adenomas have been found to be associated with the use of OCs. One study showed that OC formulations with high hormonal potency were associated with a higher risk than lower potency formulations. Although benign, hepatic adenomas may rupture and may cause death through intra-abdominal hemorrhage. This has been reported in short-term as well as long-term users of OCs. Two studies relate risk with duration of use of the contraceptive, the risk being much greater after 4 or more years of OC use. While hepatic adenoma is a rare lesion, it should be considered in women presenting abdominal pain and tenderness, abdominal mass or shock. A few cases of hepatocellular carcinoma have been reported in women taking oral contraceptives. The relationship of these drugs to this type of malignancy is not known at this time. 5. *Use in or Immediately Preceding Pregnancy, Birth Defects in Offspring, and Malignancy in Female Offspring:* The use of female sex hormones – both estrogenic and progestational agents – during early pregnancy may seriously damage the offspring. It has been shown that females exposed *in utero* to diethylstilbestrol, a nonsteroidal estrogen, have an increased risk of developing in later life a form of vaginal or cervical cancer that is ordinarily extremely rare. This risk has been estimated to be of the order of 1 in 1,000 exposures or less. Although there is no evidence at the present time that OCs further enhance the risk of developing this type of malignancy, such patients should be monitored with particular care if they elect to use OCs instead of other methods of contraception. Furthermore, a high percentage of such exposed women (from 30% to 90%) have been found to have epithelial changes of the vagina and cervix. Although these changes are histologically benign, it is not known whether this condition is a precursor of vaginal malignancy. Male children so exposed may develop abnormalities of the urogenital tract. Although similar data are not available with the use of other estrogens, it cannot be presumed that they would not induce similar changes. An increased risk of congenital anomalies, including heart defects and limb defects, has been reported with the use of sex hormones, including OCs, in pregnancy. One case control study has estimated a 4.7-fold increase in risk of limb-reduction defects in infants exposed *in utero* to sex hormones (OCs, hormonal withdrawal tests for pregnancy or attempted treatment for threatened abortion). Some of these exposures were very short and involved only a few days of treatment. The data suggest that the risk of limb-reduction defects in exposed fetuses is somewhat less than 1 in 1,000 live births. In the past, female sex hormones have been used during pregnancy in an attempt to treat threatened or habitual abortion. There is considerable evidence that estrogens are ineffective for these indications, and there is no evidence from well-controlled studies that progestogens are effective for these uses. There is some evidence that triploidy and possibly other types of polyploidy are increased among abortuses from women who become pregnant soon after ceasing OCs. Embryos with these anomalies are virtually always aborted spontaneously. Whether there is an overall increase in spontaneous abortion of pregnancies conceived soon after stopping OCs is unknown. It is recommended that for any patient who has missed two consecutive periods, pregnancy should be ruled out before continuing the contraceptive regimen. If the patient has not adhered to the prescribed schedule, the possibility of pregnancy should be considered at the time of the first missed period, and further use of OCs should be withheld until pregnancy has been ruled out. If pregnancy is confirmed, the patient should be apprised of the potential risks to the fetus and the advisability of continuation of the pregnancy should be discussed in the light of these risks. It is also recommended that women who discontinue oral contraceptives with the intent of becoming pregnant use an alternate form of contraception for a period of time before attempting to conceive. Many clinicians recommend 3 months although no precise information is available on which to base this recommendation. The administration of progestogen-only or progestogen-estrogen combinations to induce withdrawal bleeding should not be used as a test of pregnancy. 6. *Gallbladder Disease:* Studies report an increased risk of surgically confirmed gallbladder disease in users of OCs and estrogens. In one study, an increased risk appeared after 2 years of use and doubled after 4 or 5 years of use. In one of the other studies, an increased risk was apparent between 6 and 12 months of use. 7. *Carbohydrate and Lipid Metabolic Effects:* A decrease in glucose tolerance has been observed in a significant percentage of patients on OCs. For this reason, prediabetic and diabetic patients should be carefully observed while receiving OCs. An increase in triglycerides and total phospholipids has been observed in patients receiving OCs. The clinical significance of this finding remains to be defined. 8. *Elevated Blood Pressure:* An increase in blood pressure has been reported in patients receiving OCs. In some women, hypertension may occur within a few months of beginning OC use. In the first year of use, the prevalence of women with hypertension is low in users and may be no higher than that of a comparable group of nonusers. The prevalence in users increases, however, with longer exposure, and in the fifth year of use is two and a half to three times the reported prevalence in the first year. Age is also strongly correlated with the development of hypertension in OC users. Women who previously have had hypertension during pregnancy may be more likely to develop elevation of blood pressure when given OCs. Hypertension that develops as a result of taking OCs usually returns to normal after discontinuing the drug. 9. *Headache:* The onset or exacerbation of migraine or development of headache of a new pattern which is recurrent, persistent, or severe, requires discontinuation of OCs and evaluation of the cause. 10. *Bleeding Irregularities:* Breakthrough bleeding, spotting and amenorrhea are frequent reasons for patients discontinuing OCs. In breakthrough bleeding, as in all cases of irregular bleeding from the vagina, nonfunctional causes should be borne in mind. In undiagnosed persistent or recurrent abnormal bleeding from the vagina, adequate diagnostic measures are indicated to rule out pregnancy or malignancy. If pathology has been excluded, time or a change to another formulation may solve the problem. Changing to an OC with a higher estrogen content, while potentially useful in minimizing menstrual irregularity, should be done only if necessary since this may increase the risk of thromboembolic disease. Women with a past history of oligomenorrhea or secondary amenorrhea or young women without regular cycles may have a tendency to remain anovulatory or to become amenorrheic after discontinuation of OCs. Women with these preexisting problems should be advised of this possibility and encouraged to use other contraceptive methods. Post-use anovulation, possibly prolonged, may also occur in women without previous irregularities. 11. *Ectopic Pregnancy:* Ectopic as well as intrauterine pregnancy may occur in contraceptive failures. However, in progestogen-only OC failures, the ratio of ectopic to intrauterine pregnancies is higher than in women who are not receiving OCs, since the drugs are more effective in preventing intrauterine than ectopic pregnancies. 12. *Breast-Feeding:* OCs given in the postpartum period may interfere with lactation. There may be a decrease in the quantity and quality of the breast milk. Furthermore, a small fraction of the hormonal agents in OCs has been identified in the milk of mothers receiving these drugs. The effects, if any, on the breast-fed child have not been determined. If feasible, the use of OCs should be deferred until the infant has been weaned. **PRECAUTIONS: General:** 1. A complete medical and family history should be taken prior to the initiation of OCs. The pretreatment and periodic physical examinations should include special reference to blood pressure, breasts, abdomen and pelvic organs, including Papanicolaou smear and relevant laboratory tests. As a general rule, OCs should not be prescribed for longer than 1 year without another physical examination being performed. 2. Under the influence of estrogen-progestogen preparations preexisting uterine leiomyomata may increase in size. 3. Patients with a history of psychic depression should be carefully observed and the drug discontinued if depression recurs to a serious degree. Patients becoming significantly depressed while taking OCs should stop the medication and use an alternate method of contraception in an attempt to determine whether the symptom is drug related. 4. OCs may cause some degree of fluid retention. They should be prescribed with caution, and only with careful monitoring, in patients with conditions which might be aggravated by fluid retention, such as convulsive disorders, migraine syndrome, asthma, or cardiac or renal insufficiency. 5. Patients with a past history of jaundice during pregnancy have an increased risk of recurrence of jaundice while receiving OC therapy. If jaundice develops in any patient receiving such drugs, the medication should be discontinued. 6. Steroid hormones may be poorly metabolized in patients with impaired liver function and should be administered with caution in such patients. 7. OC users may have disturbances in normal tryptophan metabolism which may result in a relative pyridoxine deficiency. The clinical significance of this is yet to be determined. 8. Serum folate levels may be depressed by OC therapy. Since the pregnant woman is predisposed to the development of folate deficiency and the incidence of folate deficiency increases with increasing gestation, it is possible that if a woman becomes pregnant shortly after stopping OCs, she may have a greater chance of developing folate deficiency and complications attributed to this deficiency. 9. The pathologist should be advised of OC therapy when relevant specimens are submitted. 10. Certain endocrine and liver function tests and blood components may be affected by estrogen-containing OCs: a. Increased sulfobromophthalein retention; b. Increased prothrombin and factors VII, VIII, IX, and X; decreased antithrombin 3; increased norepinephrine-induced platelet aggregability; c. Increased thyroid binding globulin (TBG) leading to increased circulating total thyroid hormone, as measured by protein-bound iodine (PBI), T4 by column, or T4 by radioimmunoassay. Free T3 resin uptake is decreased, reflecting the elevated TBG, free T4 concentration is unaltered; d. Decreased pregnanediol excretion; e. Reduced response to metyrapone test. **INFORMATION FOR THE PATIENT:** See Patient Labeling. **DRUG INTERACTIONS:** Reduced efficacy and increased incidence of breakthrough bleeding have been associated with concomitant use of rifampin. A similar association has been suggested with barbiturates, phenylbutazone, phenytoin sodium, tetracycline, and ampicillin. **CARCINOGENESIS, PREGNANCY, NURSING MOTHERS:** See Contraindications and Warnings sections. **ADVERSE REACTIONS:** An increased risk of the following serious adverse reactions has been associated with the use of OCs (see Warnings): Thrombophlebitis; pulmonary embolism; coronary thrombosis; cerebral thrombosis; cerebral hemorrhage; hypertension; gallbladder disease; benign hepatomas; congenital anomalies. There is evidence of an association between the following conditions and the use of OCs, although additional confirmatory studies are needed: Mesenteric thrombosis; neuro-ocular lesions, eg, retinal thrombosis and optic neuritis. The following adverse reactions have been reported in patients receiving OCs and are believed to be drug related: Nausea and/or vomiting, usually the most common adverse reactions, occur in approximately 10 percent or less of patients during the first cycle. Other reactions, as a general rule, are seen much less frequently or only occasionally: Gastrointestinal symptoms (such as abdominal cramps and bloating); breakthrough bleeding; spotting; change in menstrual flow; dysmenorrhea; amenorrhea during and after treatment; temporary infertility after discontinuance of treatment; edema; chloasma or melasma which may persist; breast changes: tenderness, enlargement and secretion; change in weight (increase or decrease); change in cervical erosion and cervical secretion; possible diminution in lactation when given immediately postpartum; cholestatic jaundice; migraine; increase in size of uterine leiomyomata; rash (allergic); mental depression; reduced tolerance to carbohydrates; vaginal candidiasis; change in corneal curvature (steepening); intolerance to contact lenses. The following adverse reactions have been reported in users of OCs, and the association has been neither confirmed nor refuted: Premenstrual-like syndrome; cataracts; changes in libido; chorea; changes in appetite; cystitis-like syndrome; headache; nervousness; dizziness; hirsutism; loss of scalp hair; erythema multiforme; erythema nodosum; hemorrhagic eruption; vaginitis; porphyria; hemolytic uremic syndrome. **ACUTE OVERDOSE:** Serious ill effects have not been reported following acute ingestion of large doses of OCs by young children. Overdosage may cause nausea, and withdrawal bleeding may occur in females. **HOW SUPPLIED:** Loestrin **21** 1/20 is available in dispensers each containing 21 tablets. Each tablet contains 1 mg of norethindrone acetate and 20 mcg of ethinyl estradiol. Available in packages of five dispensers. Loestrin **Fe** 1/20 is available in dispensers each containing 21 white tablets and 7 brown tablets. 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UPDATE

Abortion and Fear of AIDS

A small-scale study of 30 abortion providers in New York City conducted by the city's Commission on Human Rights revealed that many refused to schedule appointments for women who told them they had tested positive for the human immunodeficiency virus (HIV).[1] A woman working with the commission called a series of clinics and private physicians, explained that she was eight weeks pregnant and asked for an appointment for an abortion; after the appointment was made, she added that she had tested positive for HIV. Two-thirds of the providers then cancelled the appointment, with two out of five explaining that they could not do the abortion because they lacked the appropriate equipment. The report calls for a comprehensive campaign "to educate health care providers on the nature and significance of HIV infection and transmission, as well as [on] the requirements of the public health and civil rights laws."

1. AIDS Discrimination Division, "HIV-Related Discrimination in Abortion Clinics in New York City," New York City Commission on Human Rights, New York, 1989.

Frequency of Herpes in Newborns

An 18-month long, nationwide study of herpes simplex infection among newborns revealed 184 cases, most of them unanticipated: Only one in five of the mothers had a medical history of herpes infection, and fewer than one in 10 had genital lesions at the time of delivery.[1] In 15 cases, cesarean section had been performed before rupture of the membranes, yet the operation did not prevent neonatal infection. Forty-one percent of infected infants were born prematurely, and the same proportion were of low birth weight. By one week after birth, 59 percent of infected babies had experienced seizures or had developed a fever, conjunctivitis or lesions of the skin or mucous membranes. The investigators state that they almost certainly did not detect all infections, but that the minimum annual incidence of neonatal herpes in 1984 was about four cases per 100,000 live births.

1. K. M. Stone et al., "National Surveillance for Neonatal Herpes Simplex Virus Infections," *Sexually Transmitted Diseases*, 16:152, 1989.

Dalkon Shield: The End Has Come

The long and controversial history of the Dalkon Shield appears to have reached its conclusion. In November 1989, the U.S. Supreme Court refused to hear a pair of challenges to A.H. Robins's bankruptcy reorganization plan and the trust funds established to reimburse women injured by the device.[1] The funds, which total $2.5 billion, had been set up in 1988 after the company's acquisition by American Home Products and were to be used to satisfy the more than 18,000 injury claims filed against Robins by former users of the Shield. However, the dispersal of damages was delayed when the reorganization plan was challenged by claimants who objected to some of its stipulations, especially a provision barring future lawsuits against any parties other than the trust funds. With legal challenges out of the way, the settlement process will begin again for the last group of women claiming injuries as a result of having used the device.

1. "Claimants Seek Block on Dalkon Shield Appeal," *Scrip*, No. 1,460, Nov. 1, 1989, p. 14; and "Dalkon Shield Challenges Rejected—AHP Merger by Year-End," *Scrip*, No. 1,464, Nov. 15, 1989, p. 14.

Can C-Section Save Tiny Newborns?

Reliance on cesarean section for the delivery of babies weighing between 500 g and 1,499 g nearly doubled in Missouri between 1980 and 1984, from 25 percent to 44 percent.[1] About 20 percent of the smallest babies (those born weighing 500–749 g) were delivered by cesarean section over that period, compared with 36 percent and 42 percent of those weighing 750–999 g and 1,000–1,499 g, respectively. Fifty-four percent of babies in the first group died less than one day after birth, a far higher proportion than in the other two groups (21 percent and eight percent, respectively). Among the smallest babies, those delivered by cesarean section were more likely to survive the first day of life than were those delivered vaginally (67 percent vs. 41 percent), but the chance of surviving one week was no greater for babies delivered by cesarean section than for those delivered vaginally. The investigators hypothesize that in many instances, cesarean section may simply postpone rather than prevent death. "There appears to be little justification," they conclude, "for the rapidly increasing use of cesarean section for the delivery of these small infants."

1. M. H. Malloy et al., "Increasing Cesarean Section Rates in Very Low-Birth Weight Infants: Effect on Outcome," *Journal of the American Medical Association*, 262:1475, 1989.

APHA Hereby Resolves . . .

Nine official policy statements related to reproductive health were adopted by the American Public Health Association (APHA) at its 117th annual meeting, held in Chicago in October.[1] Among them was a statement reaffirming the APHA's support of women's "fundamental right" to legal abortion and emphasizing "the importance of safeguarding the legal right of privacy and of protecting maternal health through support of reproductive choice." Other statements related to reproductive health adopted by the APHA Governing Council encouraged reducing the prevalence of cesarean delivery by means of peer review, second opinions and other approaches, as well as expanding the eligibility criteria for the Women, Infants and Children program. The APHA also passed six statements related to AIDS and infection with the human immunodeficiency virus. A total of 35 policy statements were adopted at the 1989 meeting.

1. American Public Health Association, news release, Nov. 1, 1989.

New Help for New Jersey MOMS

New Jersey has become the first state to guarantee access to prenatal care for all women who need it.[1] Beginning in March 1990, the Jersey Maternity Outreach and Managed Services (or Jersey MOMS) program will offer a full range of free prenatal care services to all pregnant women in the state with annual incomes under $18,000; those with incomes between $18,000 and $30,000 will be charged a small fee on a sliding-scale basis. The state expects the Jersey MOMS program to reach annually about 10,500 women with incomes under $30,000. In addition, the program will be open to uninsured women with an annual income over the $30,000 cutoff, who will also be charged a fee that will vary depending on their income.

1. J. F. Sullivan, "Prenatal Care Offered to All in New Jersey," *New York Times*, Dec. 5, 1989, p. B1.

Abortion and Ectopic Pregnancy

Women who have had an induced abortion are at no greater risk of experiencing a subsequent ectopic pregnancy than are those who have never had an abortion.[1] About 42 percent of a group of 211 women hospitalized over a six-year period for treatment of an ectopic pregnancy had had a previous induced abortion, compared with 39 percent of a group of 457 controls. Once multiple regression analysis was used to adjust for a wide range of background factors, the researchers concluded that even women who had had two induced abortions were at no elevated risk of developing an ectopic pregnancy. Thus, induced abortion does not seem to have contributed to the rise in ectopic pregnancies seen over the past two decades.

1. V. L. Holt et al., "Induced Abortion and the Risk of Subsequent Ectopic Pregnancy," *American Journal of Public Health*, **79**:1234, 1989.

A Girl and a Boy Are Best

The fertility behavior of American couples seems to confirm that to many Americans, the ideal family is one that has a mixture of male and female children, according to a recent analysis of data from the National Survey of Family Growth.[1] For example, couples' decisions about when to have a second child appear to be unaffected by the gender of the first child: Of all who went on to have a second birth, couples with one boy had their second child no more or less quickly than those with one girl. Among couples with two children who had a third child, however, those with two children of the same sex generally had their third child more quickly than did those who had two children of opposite sex. Nonetheless, those with two boys had their third child no more or less quickly than those with two girls.

1. J. D. Teachman and P. T. Schollaert, "Gender of Children and Birth Timing," *Demography*, **26**:411, 1989.

Running a Risk: Women and HIV

About one-third of family planning clinic patients and close to half of patients at sexually transmitted disease (STD) clinics engage in behavior that puts them at increased risk of infection with the human immunodeficiency virus (HIV).[1] A recent study of 455 women coming to such facilities revealed that 16 percent of those at family planning clinics and 45 percent of those at STD clinics had previously been infected with an STD, and that 13 percent and 22 percent, respectively, had had at least six different sex partners in the preceding five years. Moreover, five percent of family planning clinic patients and two percent of STD clinic clients said that they had used intravenous drugs. The researchers suggest that there is a "need for education and counseling regarding AIDS and HIV infection in most, if not all, clinic settings where reproductive-age women frequently seek health care."

1. S. C. Wasser et al., "Assessing Behavioral Risk for HIV Infection in Family Planning and STD Clinics: Similarities and Differences," *Sexually Transmitted Diseases*, **16**:178, 1989.

Poll Finds Abortion Support Strong

The results of an Illinois poll reveal that in most of 18 Illinois electoral districts, registered voters were strongly in favor of keeping legal abortion available as it is now.[1] At least 73 percent of voters in each district said that a woman and her doctor, not the government, should make the abortion decision. In 14 of the districts, the majority of voters said that if two candidates in an election held similar views on most issues but differed on abortion, they would vote for the candidate who supported legalized abortion. Furthermore, in all but one district, at least 60 percent of those polled said that if the decision to maintain the legality of abortion in Ilinois were to be a ballot issue, they would vote to keep abortion legal. In addition, more than half of respondents in every district said they preferred the 1973 *Roe* v. *Wade* decision to the 1989 *Webster* decision.

1. A. C. Dienesch, executive director, Planned Parenthood Association/Chicago Area, memo, Nov. 2, 1989.

Multiple Infections in Pregnancy

Pregnant women making a visit for prenatal care who test positive for gonorrhea are highly likely to be infected with *Chlamydia trachomatis* as well.[1] An analysis of 90 prenatal patients showed that 46 percent of those with a gonorrheal infection also tested positive for chlamydia, compared with just five percent of those not infected with gonorrhea. Furthermore, a multiple regression analysis that controlled for a number of background characteristics showed that gonorrheal infection was the only statistically significant independent risk factor for chlamydial infection. "All pregnant patients being evaluated or treated for gonorrhea," the authors conclude, "should also be considered at high risk for concomitant chlamydial infection."

1. J. T. Christmas et al., "Concomitant Infection with *Neisseria gonorrhoeae* and *Chlamydia trachomatis* in Pregnancy," *Obstetrics and Gynecology*, **74**:295, 1989.

Drinking Is Bad for Babies

As is well-known, women who drink alcoholic beverages during pregnancy may cause injury to the fetus, but new research also suggests that alcohol consumption during breastfeeding may have a detrimental effect on an infant's physical development.[1] A study of 400 infants indicates that although maternal drinking during breastfeeding has no clear impact on the baby's mental development, infants whose mother consumed one drink per day scored significantly lower in motor development and coordination; the association was even stronger when women who had supplemented their baby's diet with commercial formula were excluded. A multiple regression analysis that controlled for more than 100 factors did not reduce the size of the effect. However, the researchers caution that their findings are only "suggestive," and must be confirmed by larger, broader-based studies.

1. R. E. Little et al., "Maternal Alcohol Use During Breast-Feeding and Infant Mental and Motor Development at One Year," *New England Journal of Medicine*, 321:425, 1989.

When Urban Adolescents Choose Abortion: Effects on Education, Psychological Status And Subsequent Pregnancy

By Laurie Schwab Zabin, Marilyn B. Hirsch and Mark R. Emerson

Summary

A group of 360 black teenage women of similar socioeconomic background who sought pregnancy tests from two Baltimore family planning providers was followed for two years to determine if those who obtained abortions were adversely affected by their abortion experience. After two years, the young women who had terminated their pregnancies were far more likely to have graduated from high school or to still be in school and at the appropriate grade level than were those who had decided to carry their pregnancy to term or those whose pregnancy test had been negative. Those who had obtained an abortion were also better off economically than were those in the other two groups after two years. An analysis of psychological stress showed that those who terminated their pregnancy had experienced no greater levels of stress or anxiety than had the other teenagers at the time of the pregnancy test, and they were no more likely to have psychological problems two years later. The teenagers who had obtained abortions were also less likely than the other two groups to experience a subsequent pregnancy during the following two years and were slightly more likely to practice contraception. Thus, two years after their abortions, the young women who had chosen to terminate an unwanted pregnancy were doing as well as (and usually better than) those who had had a baby or who had not been pregnant.

The young women in the abortion group were neither directly nor indirectly any more likely than those in the control groups to suffer a change for the worse psychologically. In fact, they experienced less negative change than the other teenagers.

Introduction

For the past decade and a half, approximately 40 percent of U.S. teenagers who have conceived each year have elected to terminate their pregnancies.[1] Among women younger than 16, 1.7 abortions have occurred for each live birth in the last several years; thus, in this age-group, pregnancy termination is more common than childbirth.[2]

The effects of childbearing upon adolescent mothers have been scrutinized and enumerated, and independent adverse effects upon schooling, economic and social status, marital stability, maternal and infant health and future fertility have been documented; furthermore, the children born to teenage parents have been shown to suffer deficits as well.[3] Recent evidence suggests that some early differentials in outcome between teenage mothers and their peers are overcome or diminish with time[4] but that many of the problems experienced by their offspring are long-lasting. Thus, the early stresses upon young mothers are of enduring importance, whether or not they continue into the mothers' later lives.

Although almost as many young women terminate their pregnancies as carry them to term, there has been little research examining the effects of abortion that is comparable to that described above for adolescent childbearing. Only a small number of studies have focused on adolescents who conceive, and only a few have compared the experiences of teenagers who choose abortion to those of women of similar ages and similar social and economic backgrounds who choose to bear a child. Most studies of the sequelae of abortion, whatever the age of the woman, examine the effects of abortion on subsequent fertility[5] or psychological outcome.[6]

There appears to be a consensus that abortion rarely has adverse psychological sequelae, whatever the stage at which the pregnancy is terminated.[7] When negative psychological effects have been reported, they often appear to have been related to other factors. The woman's prior emotional condition plays a major role,[8] as does marital status: Unmarried women are more likely to experience negative sequelae,[9] perhaps because they do not have the support system that married women have. Many studies have indicated that family support for abortion is salutary, but when significant others do object, such opposition is strongly related to adverse effects.[10] The wantedness of the pregnancy can also have much to do with abortion's impact: Women terminating an unwanted pregnancy may find their course of action more beneficial psychologically than carrying a pregnancy to term,[11] and may experience a lower incidence of psychosis.[12] Not surprisingly, a woman who terminates a wanted pregnancy (for genetic reasons, for example) is likely to suffer more serious and prolonged effects.[13] Because the overwhelming majority of adolescent pregnancies occur among unmarried women and are not intended,[14] these differences are important when the implications of abor-

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Laurie Schwab Zabin is associate professor, Marilyn B. Hirsch is an associate and Mark R. Emerson is a programmer in the Department of Population Dynamics at The Johns Hopkins School of Hygiene and Public Health. The authors are grateful to the National Institute of Child Health and Human Development, which funded the data collection for this study; this article was prepared under a grant from the Ford Foundation, which is supporting analysis of the data. Elizabeth West and Ann Rutledge interviewed and followed up on the study participants and, along with Jane Davis, helped prepare the data for analysis; Jean Box interviewed participants in the first year. The data were collected at The Johns Hopkins Comprehensive Child Care Center and at Planned Parenthood of Maryland (directed by John A. Boscia and J. Courtland Robinson, respectively).

tion for teenagers are being considered.

Some of the psychological effects that have been examined include depression, guilt, happiness, regret and anxiety. There has been one report of an adolescent attempting suicide at about the time she would have given birth had she not obtained an abortion.[15] However, a prospective study found less psychosis associated with abortion than with childbearing.[16] It is difficult to separate the temporary malaise sometimes associated with abortion from the stress of the accidental pregnancy itself, especially because according to most researchers, unhappiness, when it is reported at all, is generally short-lived; the usual feeling following the procedure is one of relief.[17]

Among the few studies that have focused on adolescents, some have followed small groups of teenagers who had abortions, to determine their subsequent contraceptive practice and fertility experience. A 1979 study showed an increased probability of repeat pregnancy during the six months after the outcome of the original pregnancy among those who obtained abortions compared with those who carried their pregnancy to term; however, by two years, this relationship was reversed.[18] Other research has identified no such difference, however,[19] and some have found that among adolescents, both regularity of contraceptive use and use of effective methods appear to increase following abortion.[20]

Serious flaws have been identified in much of the research on abortion sequelae.[21] The lack of suitable controls has been a recurrent problem. When controls have been used, confounding factors have weakened the studies (for example, when controls differed from cases on basic characteristics, such as socioeconomic or marital status). An inability to separate baseline characteristics from sequelae has been another problem. Observation bias has also entered the question when subjective measures of psychological response have been used. Tested indices of psychological function are needed, as well as indices that separate passing moods from underlying traits.

Because intervening events can affect sequelae, it may be necessary to limit the time span under scrutiny, even if, in so doing, some longer term sequelae cannot be addressed. Because some sequelae may be short-term, there is a need for observations to be made at several points in time. The ideal study would be a prospective one in which young women would be enrolled before first intercourse and would be followed through pregnancy and their decision to obtain an abortion or carry the pregnancy to term; they would then be interviewed several times following the outcome. Such a study has been called for by the Surgeon General.[22] However, such a study would clearly need to have an immense sample population and to go on for an extremely long time.

The longitudinal study described here explores the consequences of abortion among adolescents. Designed to overcome specific methodological problems found in earlier research, it represents a compromise, in that we did not enroll subjects prior to intercourse or, necessarily, prior to conception. Rather, they were enrolled before pregnancy was confirmed and were followed over a two-year period. The emphasis of this research is on change; hence, we make a concerted effort to separate preexisting characteristics from sequelae. The research also focuses on one particular segment of the population to guarantee that the subjects and controls come from similar geographic, racial, social and economic backgrounds.

Methodology

A total of 360 young black women were recruited when they came to one of two sites—The Johns Hopkins Comprehensive Child Care Center or Planned Parenthood of Maryland—for pregnancy tests in 1985 and 1986. The young women were all of lower socioeconomic background, 17 years of age or younger and unmarried at that time. None had a baby of her own to care for. Only three had ever given birth; two had had stillbirths and one had had a child who was no longer living with her.

The respondents fell into one of three groups: those whose pregnancy test came back negative, those whose test was positive and who elected to have an abortion and those whose test was positive and who chose to carry the pregnancy to term. The young women with positive pregnancy tests who had an abortion represented the study group. Those who elected to carry the pregnancy to term represented one control group; they are a logical sample to compare with the abortion group, since they were diagnosed as being pregnant at the same provider sites but chose the alternative outcome. However, the longer one follows them into the future, the less the comparison reflects the experience of childbearing vs. the experience of abortion, and the more it reflects the effects of motherhood itself. The negative-test group serves as another comparison group: They were similar to the abortion group in that they came for a pregnancy test at the same time and place, and by their suspicion of pregnancy, they acknowledged their sexual exposure. Furthermore, because at their follow-up interviews they were not raising a child as a result of their exposure at baseline, they were in many important ways more comparable to the abortion group than were those with a child.

The young women gave consent to participate in the study, were enrolled and provided extensive baseline data before they or their interviewers knew the result of their pregnancy test. All were followed up at six-month intervals for two years, making it possible to identify time-limited sequelae within that period. Extensive year-one and year-two interviews were administered in person; limited information was collected by telephone at six and 18 months.

Of the original 360 participants, 26 have been entirely omitted from this report: Fourteen were lost to follow-up and cannot, therefore, be assigned to an outcome group with any certainty, and 12 miscarried. (The latter group is too small for separate analysis.) Thus, there were 334 teenagers included in the baseline reports—141 who terminated their pregnancies, 93 who carried them to term and 100 who had negative pregnancy-test results. Over 90 percent of the baseline sample was included in the year-two follow-up—122 in the abortion group, 88 in the childbearing group and 92 in the negative-test group.

Closed-ended interviews were used to collect information on household structure, education, jobs and economic well-being, health, growth, sexual and contraceptive behavior and conception and fertility. Although this information was gathered retrospectively, these baseline data were not affected by pregnancy because they were collected before the outcome of the pregnancy test was known. In addition, the respondents were given several psychological tests, including the abbreviated Rosenberg Self-Esteem Scale,[23] items from the Rotter Locus of Control scale[24] and the Spielberger State-Trait Anxiety Index (STAI).[25] The STAI was the only portion of the instrument that was not orally administered by the interviewer; it was completed by the respondent, with the interviewer on hand to answer questions if asked. The psychological portion of the baseline data could, of course, have been affected by the stress of a potential pregnancy, a problem that is addressed below.

By concentrating on *change* in characteristics rather than on characteristics at any

Table 1. Percentage of respondents, by school status and time period, according to study group

School status and time period	Study group		
	Abortion (N=120)	Child-bearing (N=86)	Negative preg. test (N=92)
Currently in school or graduated			
At baseline	99.2	90.7**	94.6
At 1 year	92.5	74.7**	83.5
At 2 years	90.0†	68.6**†	79.3*†
Behind grade for age			
At baseline	35.6	51.2	52.8*
At 1 year	39.2	52.7	56.6*
At 2 years	41.5	57.1*	57.3*
Negative educational change			
At 1 year	13.5	31.6**	26.9*
At 2 years	17.8	37.3**	37.4**

*Difference between this group and abortion group significant at p<0.05.

**Difference between this group and abortion group significant at p<0.01.

†Two-year trend significant at p<0.01.

Note: In this table and tables 2–4, Ns refer to the number of respondents interviewed at baseline and at two years; a somewhat smaller number were reached at one year.

one time, we attempt to avoid the confusion of antecedents and consequences. It is assumed that a change occurring subsequent to the event that is significantly different in size or direction from that found among those who do not experience the event can be treated as a consequence of the event. However, we have collected information in enough areas of these young women's lives so that alternate explanations for observed change can also be explored. Furthermore, by collecting baseline data before the index pregnancy is diagnosed, we also report on the original characteristics of the groups so that their choice of outcome, as well as their paths following the event, can be better understood. In addition, the results of the study cannot be considered applicable to the general population. Rather, the study was designed to provide a close-up picture of individuals of similar background directly before and for a few years after the event in question.

Baseline Characteristics

At baseline, the three groups were similar with regard to most variables; detailed information on the the results of the baseline interviews is reported elsewhere.[26] There were few differences in religion, although the percentage who were Roman Catholic was almost three times as high in the abortion group as in the childbearing group. The groups were almost identical in terms of the teenagers' mean age at the first visit (16.1 years).

Each respondent was asked to identify the woman who had "raised" her, whether or not that woman was her biological mother. The marital status of the women so identified did not differ between the three groups. The mothers (or surrogate mothers) of the teenagers in the abortion group were somewhat more likely to be working, to have graduated from high school and to have been older at first birth than were the females who had raised the teenagers who carried to term; however, none of these relationships were statistically significant. The mothers or surrogate mothers of the abortion group were significantly more educated than were those of the negative-test group (mean highest grades achieved, 12.3 and 11.7 years, respectively), although the mean educational level of neither group differed significantly from that of the parents or guardians of the childbearing group (11.9 years). Approximately 80 percent of all the subjects lived with their biological mothers, and almost all in each group lived at home with their biological mother, stepmother or foster mother.

There is some evidence that the members of the abortion group were more carefully supervised: Significantly more of them reported curfews on weekdays and on weekends (72 percent) than did teenagers in the childbearing and negative-test groups (54 percent and 66 percent, respectively). Similarly, there were indications that those who chose abortion were somewhat better off than the others economically, at least when that was measured by the ratio of working adults to others in the household. (We used the proportions of working members of the household as a summary measure of economic well-being because this is one of the few economic measures that adolescents could be expected to know.) This measure was computed in two ways: the ratio of working adults to all adults in the household, and the ratio of working adults to all household members. The first measure revealed no significant differences between the groups; differences in the second case (0.31 in the abortion group vs. 0.25 and 0.26 in the childbearing and negative-test groups, respectively) were not quite statistically significant (p=0.06). This nonsignificant tendency toward greater financial well-being among teenagers who chose abortion is reflected in other economic measures reported elsewhere.[27]

Educational variables discriminated significantly between the groups at baseline but did not suggest differences in the expectation of high school completion. Almost all subjects had been in school during the year preceding their pregnancy test, and although significantly fewer members of the childbearing group were still in school at the time of the first interview, they nonetheless expected to finish 12th grade. The baseline data suggest many similarities between the childbearing and negative-test groups that are explored elsewhere.[28] Fewer members of the abortion group had repeated a grade, and fewer expected to terminate their education at high school completion.

Status Two Years Later

In comparisons between baseline and two years later, only those respondents for whom year-two data were available are included in the baseline estimate. In the tables that follow, the year-one information is included to illustrate trends, but the sample is somewhat smaller because some young women interviewed at two years were missed at the year-one interview. (Interrelationships among variables—for example, among educational and economic variables—await future analyses.)

- *Educational status.* Although there were only small differences between the groups at baseline in the percentage who were in school, the differences at one year were dramatic, and they increased at two years (see Table 1). Not surprisingly, most of the change occurred in the first year; as more young women graduated, smaller percentages were available to experience this change. Furthermore, in the childbearing group, the first year may be the critical one, when the pregnancy takes its immediate toll. However, the numbers are worse for this group at two years: The percentage who were in school or who had graduated continued to decline more than it had for the other two groups.

The changes were not as great in the proportions of teenagers who had fallen behind their appropriate grades over the two years. (High school graduates are included among those at correct grade for age.) This is because over half of the childbearing and negative-test groups were already behind at baseline; time forced only a few more into their ranks. Nonetheless, it is clear in the summary variable—negative educational change—that the effects of early childbearing reported in the literature were already occurring at the year-one follow-up and were increasing by the second year. By two years after the pregnancy test, 18 percent of the abortion group had either left school before graduation or, if they were still in school, had failed to progress the expected two years. In contrast, over 37 percent of the childbearing and negative-test groups had experienced such a negative educational change. These differences cannot be explained by the pregnancy per se or by events responsible for the pregnancy, because they were significantly less likely to affect the teenagers who conceived at the same age but terminated the unintended pregnancy.

None of these differences could have been predicted based on the teenagers' educational expectations at baseline; all had expected to complete high school. The fact that they followed different educational paths is not surprising, in view of the differentials in their prior expectations for education beyond high school, and to some extent in their prior achievement. For example, the long-term expectations of the childbearing and abortion groups were significantly different at baseline: Fewer than 53 percent of the childbearing and negative-test groups expected to continue their schooling after high school, compared with 73 percent of the abortion group (not shown). More of both control groups were already behind in school for their ages, reflecting the higher proportion who had repeated grades in the past. However, grade-point averages of the three groups were extremely close (79.8 for the abortion group, 79.3 for the childbearing group and 79.5 for the negative-test group); many of the students who experienced a negative educational change had planned to continue into higher education; and few (three out of the entire sample) had expected to terminate their education before high school graduation. Thus, the negative change they experienced was not in line with their baseline expectations.

Using data from young women whose year-one interviews fell during summer vacation, we explored one more measure of the respondents' ability to live up to their own expectations: whether they expected to return to school in the fall. All of the abortion group, 90 percent of the childbearing group and 88 percent of the negative-test group said that they expected to do so. However, among all of the young women interviewed over the summer, 93 percent of the abortion and 88 percent of the negative-test group but only 65 percent of the childbearing group actually were in school six months later. At the 18-month interviews, then, we discovered that among those who had expected to return, 93 percent of the negative-test and abortion groups and 72 percent of the childbearing group were able to meet their own expectations. (One teenager in the negative-test group who had not expected to return to school did in fact return, and one who had expected to did not.) Thus, it was the teenagers who chose to carry their pregnancy to term who experienced the greatest risk of failing to meet their own educational expectations.

- *Economic well-being.* The economic well-being of the abortion group did not deteriorate as did that of the childbearing group; whereas differences between the groups were not statistically significant at baseline, they were significant both one and two years later (see Table 2). One would have expected the ratio of working adults to all members of the household to change when a baby was added, and differences between the abortion group and the childbearing group, which were not significant at baseline, did indeed become significant at one and two years. When the effect of the presence of the baby was removed by computing the ratio of working adults to all *adults* in the household, differences remained significant in both follow-up periods. According to this measure, the members of the childbearing group appear to have fallen further behind (even though they had improved very slightly in the second year), because the abortion group's status continued to improve, so that the differences between these two groups increased over time.
- *Psychological sequelae.* These have been particularly difficult to study because of problems in establishing a true baseline against which to measure them. Only a longitudinal study of a randomly selected group of young women that begins long before their exposure to abortion could permit the performance of an accurate psychological appraisal, uncontaminated by the effects of a suspected pregnancy. The numbers required for such a study would remain sufficient only if one began with an extremely large sample and waited a very long time. On the other hand, once women are exposed to the need for a pregnancy test, there is legitimate concern that a true picture of baseline psychological status, free of the stress of unwanted conception, is no longer possible.

This prospective study, in which baseline data were collected while the teenagers awaited the results of their pregnancy test, could not answer this challenge by removing the stress of the occasion. However, we could attempt to control for this stress by separating each respondent's transient psychological state from her underlying psychological trait. We attempted to do this by using the STAI, and there is good evidence that the STAI did indeed make such a separation. Table 3 shows that at the baseline interview, a stressful time in the young woman's life, the state measure was significantly higher (p=0.00) than the trait for each of the three groups. One and two years later, on the other hand, the state and trait scores were no longer significantly different. In each case, the state score was dramatically lower than at baseline; the trait scores were also lower, suggesting that they were not totally unaffected by the stress of the moment, but the differences, although significant, were very much smaller. If we rely

Table 2. Ratio of number of working adults to total number of household members and to total number of adult household members, by time period, according to study group

Ratio and time period	Study group		
	Abortion (N=120)	Child-bearing (N=86)	Negative preg. test (N=91)
Working adults to all members			
At baseline	0.307	0.254	0.249*
At 1 year	0.397	0.206**	0.286**
At 2 years	0.461†	0.264**	0.313**†
Working adults to all adults			
At baseline	0.601	0.512	0.497
At 1 year	0.623	0.486*	0.517*
At 2 years	0.714†	0.528**	0.540**

*Difference between this group and abortion group significant at $p<0.05$.

**Difference between this group and abortion group significant at $p<0.01$.

†Two-year trend significant at $p<0.01$.

Table 3. Respondents' percentile rankings, by type of anxiety measure and time period, according to study group

Measure and time period	Study group		
	Abortion (N=116)	Child-bearing (N=63)	Negative preg. test (N=84)
State			
At baseline	74.6	74.2	71.0
At 1 year	45.6	50.6	52.1
At 2 years	43.6†	48.3†	47.8†
Trait			
At baseline	56.8	62.4	62.9
At 1 year	48.3	51.2	59.5**
At 2 years	45.7†	52.0*†	53.2*†

*Difference between this group and abortion group significant at $p<0.05$.

**Difference between this group and abortion group significant at $p<0.01$.

†Two-year trend significant at $p<0.01$.

Table 4. Respondents' scores, by psychological measure and time period, according to study group

Measure and time period	Study group		
	Abortion (N=119)	Child-bearing (N=87)	Negative preg. test (N=92)
Self-esteem			
At baseline	3.21	3.11	3.13
At 1 year	3.31	3.20	3.23
At 2 years	3.37‡	3.25‡	3.23**†
Locus of control			
At baseline	2.88	2.81	2.83
At 1 year	3.00	2.87*	2.93
At 2 years	3.00‡	2.88*	2.96‡

*Difference between this group and abortion group significant at p<0.05.

**Difference between this group and abortion group significant at p<0.01.

†Two-year trend significant at p<0.05

‡Two-year trend significant at p<0.01.

on the trait score, then, we can make some estimate of a young woman's anxiety level that will not have been unduly influenced by the stress of the pregnancy at the time of her admission to the study.

In all three groups, the state measures were understandably high at baseline; those who elected abortion were similar in their state measure to the childbearing group. Among the abortion patients, the state measure one and two years after the pregnancy test was nonsignificantly lower than among either of the other groups and was nearer to the national STAI norm for high school females.[29] Although stress was high while the teenagers awaited the results of their tests, the decision to have an abortion apparently did not lead to a higher level of anxiety. The trait measure suggests that the members of the abortion group were normally less anxious people and remained so at the later dates. There was no statistically significant difference between the abortion and childbearing groups in the magnitude of the change between the year-one and year-two interviews.

Two other psychological measures—the Rosenberg Self-Esteem Scale and a measure of locus of control that was based on an abbreviated Rotter inventory*—were administered to the participants as well. There were nonsignificant differences between the groups at baseline (see Table 4): The abortion group's ratings on self-esteem and locus of- control were nonsignificantly higher than those of the other two groups. All three groups experienced small but significant increases in mean self-esteem, and the abortion and negative-test groups showed significant increases in locus of control, indicating greater internalization.

Because a minimal increase in anxiety or decrease in self-esteem or a minimal externalization of locus of control may be of little substantive importance, and since most of the sample experienced a positive change in psychological state, we computed the percentage of each group who experienced an adverse change in all three measures (not shown). Only 5.5 percent of the two control groups and an even smaller proportion (4.0 percent) of the abortion group experienced such changes during the first year, a clear indication that the young women who had elected abortion were at no short-term psychological disadvantage. After two years, the abortion group was hardly changed: Only 4.5 percent had experienced a negative psychological change in two years' time. The childbearing group had not changed either, but in the negative-test group, almost 10 percent of the teenagers had experienced a decline in all three psychological measures.

We next explored whether there was a relationship between the psychological and educational variables. (Some researchers have suggested a possible relationship between psychological status and educational expectations and have proposed that childbearing may be related to lower levels of self-esteem.[30]) Could the young women who experienced a negative change in their educational careers subsequent to the pregnancy test have been identified in advance through the psychological variables reported here?

The present data confirm a relationship between self-esteem and educational expectations. In each group, those who aspired to a four-year college education (or more) had significantly higher self-esteem scores than did those who were content with a high school education (not shown). Similarly, the few members of the abortion group who experienced a negative educational change over the two-year period were much more likely to have had self-esteem scores below the median of the sample at baseline than the majority who suffered no adverse change (significant at p=0.01). They were also more likely to have had scores showing less internalization of control and to have been above the median on the anxiety scale, although these differences were not significant. They do not, however, demonstrate more psychological change (not shown).

Thus, the young women in the abortion group were neither directly nor through an intervening change in educational career any more likely than those in the control groups to suffer a psychological change for the worse during the observation period. In fact, they experienced slightly less negative change than did those in the childbearing or negative-test groups. Any differences in psychological status between those in the abortion group whose education stayed on track and those who dropped out of school were preexisting and did not appear to have been a consequence of their abortion experience.

This was not the case among those in the childbearing group: Those who suffered a setback in their education were only marginally lower in self-esteem and locus of control at baseline than were those who suffered no educational setback, and were no higher in anxiety, but these differences tended to widen over the two years of observation. Those in the childbearing group who experienced a negative change in their educational progress were more than four times as likely to suffer a negative psychological change as were those who stayed on their educational course (10.0 percent vs. 2.3 percent).

Subsequent Pregnancy

The above findings indicate that the abortion group did not experience negative educational, economic or psychological consequences, but even the small amount of change seen in these data is not random; subsequent pregnancy is an important intervening variable. There are several different ways to estimate the incidence of subsequent pregnancy in the years after the teenagers entered the study. Clearly, over a two-year observation period, there is more time for a woman to conceive again if she terminates the first pregnancy than if she carries it to term, and even more time for those whose pregnancy test was negative. By controlling for the number of months following the outcome, we can set up an analysis in which all young women are exposed to the risk of pregnancy for a similar period of time. The longest period of exposure available for comparison is 18 months after the outcome of the index pregnancy test. (Most who carried to term had delivered by six months after the test.) The percentage of respondents experiencing a conception within that time period was greatest in the negative-test group (58 percent) and lowest in the abortion group (37 percent), while those in the childbear-

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*The Rotter inventory measures the degree to which the respondent believes herself in control of her life (known as the degree of internalization) and the extent to which she believes herself a victim of external forces.

Table 5. Percentage of respondents, by school status, according to study group and to whether or not they experienced a subsequent pregnancy

School status	Study group and subsequent pregnancy status					
	Abortion		Childbearing		Negative preg. test	
	Subs. preg. (N=41)	No subs. preg. (N=77)	Subs. preg. (N=33)	No subs. preg. (N=37)	Subs. preg. (N=50)	No subs. preg. (N=41)
% in school or graduated at 2 years	78.0	97.4**	60.6	69.4	78.0	80.5
% behind grade for age at 2 years	58.5	30.7**	57.6	58.8	53.2	61.0
% experiencing negative educational change	34.1	8.0**	45.2	31.4	34.7	41.5

**Difference between subgroups significant at $p<0.01$.

ing group experienced a 47 percent risk of conceiving during the same exposure period.

Table 5 shows that if the abortion group is divided among those who did or did not conceive subsequently, the proportion who suffered a negative educational change becomes trivial among those who were not pregnant over the two-year period. Almost all of the observed negative change reported earlier occurred among the 37 percent who had experienced a repeat pregnancy. Among those who had not become pregnant again, only eight percent experienced a negative educational change, while among those who had become pregnant again, 22 percent had left school without graduating, 59 percent were behind in grade for age and 34 percent suffered some negative educational change.

Thus, a subsequent pregnancy plays a key role: Those who did not conceive again were at negligible educational risk subsequent to their abortion, while those who became pregnant were at a level of risk that paralleled and even exceeded that experienced by some of the young women who bore a child. By two years, almost half of those in the childbearing group had had another conception; these teenagers had a nonsignificantly increased risk of negative educational change. Table 5 also demonstrates the clear high-risk status of the negative-test group: More eventually conceived than did not, and educational progress was disturbed without regard to pregnancy.

Of course, many of the subsequent pregnancies reported here had not yet reached an outcome by the two-year point. This is especially the case when the first pregnancy was carried to term. When respondents whose subsequent conceptions had already culminated in a birth were compared with those who had terminated a subsequent pregnancy or those who were currently pregnant, the results suggest that the subsequent birth of a baby to those in the childbearing group was associated with a much more pronounced adverse change in education (not shown). Having another baby was also associated with greater deficits in economic well-being. This was not the case in the abortion group: Those who conceived again appeared to be almost equally at risk of greater deficits in these areas, whatever their pregnancy outcome.

A subsequent birth was associated not only with negative educational change, but with psychological deficits as well (although such changes remained relatively rare). Whereas only 3.4 percent of all members of the abortion group experienced a negative psychological change, 9.5 percent of those who had had an abortion and subsequently carried a pregnancy to term experienced a negative change in all three psychological measures reported here over the two-year period.

About half of the subsequent pregnancies occurring during the 18-month interval among those in the abortion group resulted in childbirth; the others either had not come to term by the year-two follow-up or had been terminated. One-third of the new conceptions among those in the childbearing group had resulted in another birth by the time of the year-two interview, as had well over half of the conceptions among those in the negative-test group. Although the respondents were all two years older than at entry, most did not want these pregnancies. Almost 58 percent of the young women in the negative-test group who became pregnant had not wanted to conceive at any time during the two-year period; in the childbearing and abortion groups, 75 percent and 80 percent, respectively, of pregnancies conceived during the observation period were similarly unintended. Overall, 31 percent of the young women in the negative-test group had conceived unintentionally; this level of unwanted pregnancy is rather similar to those in the childbearing and abortion groups (24 percent and 27 percent, respectively).

Finally, we examine whether differentials in contraceptive use as reported by the young women accounted for the variations in pregnancy during the observation period. Table 6 indicates that within the abortion and negative-test groups,

Table 6. Percentage distribution of respondents, by contraceptive-use status between one-year and two-year interviews,† according to study group and whether or not they experienced a subsequent pregnancy

Contraceptive-use status	Study group and subsequent pregnancy status								
	Abortion			Childbearing			Negative preg. test		
	All (N=117)	Subs. preg. (N=40)	No subs. preg. (N=75)	All (N=88)	Subs. preg. (N=33)	No subs. preg. (N=38)	All (N=90)	Subs. preg. (N=48)	No subs. preg. (N=41)
% who did not use	5.1	10.0	2.7**	5.7	3.0	10.5	10.0	12.5	7.3*
% who used sometimes or very few times	17.9	32.5	9.3**	26.1	42.4	18.4	41.1	52.1	29.3*
% who used always or most of the time	76.9	57.5	88.0**	68.2	54.5	71.1	48.9	35.4	63.4*
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

†Or, in the case of respondents who could not be interviewed after one year, between baseline and two-year interview.

*Difference between the group with a subsequent pregnancy and the group with no subsequent pregnancy significant at $p<0.05$.

**Difference between the group with a subsequent pregnancy and the group with no subsequent pregnancy significant at $p<0.01$.

Note: The Ns in the childbearing subgroups do not add to the total because not all women were exposed for a full 18 months before the two-year interview; the Ns in the other two groups do not add to the total because a few women did not provide information on subsequent pregnancy.

there were significant differences in contraceptive use (in the expected direction) between those who conceived during the 18 months following the baseline outcome and those who did not. Among those in the childbearing group, the difference was almost as great, but was not statistically significant (p=0.06). There was, however, a highly significant difference between the abortion and negative-test groups: The low levels of contraceptive use seen in the table explain the high conception rate in the negative-test group. Members of the childbearing and abortion groups did not differ significantly in terms of contraceptive use, although consistent contraceptive use appeared more common among those who terminated their baseline pregnancy.

A few respondents who were not practicing contraception told us that they wanted to conceive (or, at least, that they had wanted to conceive at some time during the observation period). Although the small number of cases necessitates extreme caution in interpreting the data, it would appear that 84 percent of the abortion group who did not want to become pregnant used contraceptives all or most of the time, and among the majority who successfully avoided conceiving, this proportion was 94 percent (not shown). Although significant associations between contraceptive use and wantedness appeared in all groups, there were no subgroups in the childbearing or negative-test groups in which contraceptive use appears to have been as consistent as it was among the large number of young women in the abortion group trying to avoid pregnancy.

Multiple Regression Analysis

The above results suggest that the abortion group was doing as well as or better than the other two groups in all respects at the year-two follow-up. We noted previously that they had some advantages at baseline. Although these were often small, some were statistically significant; it was of interest, therefore, to determine if the members of the abortion group were doing better at follow-up, and if so, whether their better outcomes could be fully attributed to their baseline educational, economic or psychological status and not to their different experiences following the index pregnancy tests.

A series of regression models was proposed to test this hypothesis in relation to negative educational change, negative change in economic well-being and negative change in all three psychological variables. The importance of group status was consistently confirmed in relation to educational change. Measures of achievement (grade-level status for age), educational status (in school or graduated) and educational expectations (highest level of schooling expected) were added singly or in several combinations. In each case, membership in the abortion group rather than in the childbearing group, or in the abortion group rather than in the negative-test group, remained statistically significant in a positive direction, confirming the bivariate relationships reported above.

Similarly, in a model that included a mix of background variables measured at baseline—the education of the female parent or guardian, maintenance of a curfew, self-esteem, anxiety trait and grade-level status for age—membership in the abortion group remained significant and positive in relation to educational change.

With respect to negative change in adult job ratios, the function of group membership was also clear, again reflecting the bivariate findings. Membership in the abortion group relative to the childbearing and negative-test groups remained significant in models that included the ratios in Table 2, as well as in models in which the family's receipt of food stamps and a social services check were included. Thus, the two-year improvement reported in the abortion group's well-being remained significant even when differences in their baseline characteristics were controlled for.

Similar models showed that although group membership was not significant in relation to negative psychological change, no other baseline variables were either. All of the groups changed significantly over time in all of their psychological measures, with the exception of locus of control among the childbearing group. Furthermore, there was a high level of correlation between change in one measure and change in another. However, in none of the index groups did the level of change appear significantly different from the level of change in another, which is reflected in both the bivariate and multivariate analyses.

Conclusion

The abortion group, then, appears to have been doing well. Few have experienced a negative change in life course. The positive position of the abortion group relative to the other two groups is attributable to three factors: First, they were slightly (but usually nonsignificantly) better off at the outset in their educational and economic prospects. Second, they had no reason to deteriorate in the educational or economic variables we examined, and they showed no evidence of negative change. Third, the rare deficits experienced by the abortion group were triggered by a subsequent pregnancy, as they were with the negative-test group, and the relative status of the abortion group improved in the course of the intervening years because fewer of them experienced another pregnancy.

Although it has been demonstrated that abortion is a safe procedure for adolescents, presenting less medical risk than childbirth,[30] some have proposed that the procedure may have adverse psychological effects. Although this study tapped only three dimensions of psychological well-being, the results suggest that such a hypothesis should be rejected. The young women who chose abortion did not differ significantly from their peers in most respects at baseline and at follow-up were doing well (in both absolute and relative terms) on each of the psychological measures we used. Because they have stayed on course with their education and have put no additional economic burden on their families, there is reason to believe that in time, they will be in an even better position relative to the other groups.

The data presented here also confirm the effects of childbearing on education, showing that the adverse consequences of early motherhood begin immediately, and even though the pace of negative change slows in the second year, the continuing success of the abortion group increases the differential. While baseline characteristics might have predicted long-term differences in educational achievement, they would not have predicted the fact that so many members of the control groups dropped out before completing high school. Baseline characteristics did suggest the high risks to which the young women with negative pregnancy tests would be exposed in the observation period. We have discussed this group in more detail elsewhere,[31] noting not only their resemblance to those in the childbearing group but also the fact that the proportion among them who wanted to conceive a child during their teenage years was higher than in either of the other groups. The emerging economic deficits of the childbearing and negative-test groups relative to the abortion group also confirmed the latter group's more positive experience. In addition to the effects of a subsequent pregnancy on education, we have noted in the abortion group a significant difference at baseline in self-esteem between the respondents who did or did not experience some negative change in their educational careers. Although direct effects of self-esteem on subsequent conception cannot be demonstrated, the findings described here suggest that the use of an abbreviated, validated Rosenberg Self-Esteem Scale might be helpful at an initial abortion interview to identify high-risk individuals.

The results of our two-year study underline the need for better contraceptive counseling. We discuss elsewhere[32] the serious implications of these data for counseling following a negative pregnancy test, and there is clear evidence here that those who choose to carry their pregnancy to term also need intensive contraceptive support. The importance of better contraceptive education and counseling following pregnancy termination is also clear. The percentages of the three groups who conceived during the observation period, and the contraceptive behavior associated with those pregnancy rates, suggest that the abortion group was doing better than the childbearing group and much better than the negative-test group. However, 37 percent still conceived, only one in five because they wanted to do so (at any time during the observation period, not necessarily at the time of conception).

The percentage of negative educational change experienced by the members of the abortion group who subsequently had a child during the observation period was almost identical to that experienced by the childbearing group; the negative educational change experienced by the other members of the abortion group was trivial. And while the overall level of negative psychological change was minimal, those in the abortion group who subsequently conceived and bore a child experienced almost three times the change observed among other members of the abortion group. These differences suggest the importance of avoiding another conception. Finally, the similarities between the childbearing subgroup of the abortion group and the original childbearing control population tell us that the few negative consequences we have observed are almost certainly consequences of motherhood, not the sequelae of abortion.

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Children's Experience in Single-Parent Families: Implications of Cohabitation and Marital Transitions

By Larry L. Bumpass and James A. Sweet

Summary

Data from the National Survey of Families and Households indicate that 10 percent of children born between 1960 and 1968 were born outside of marriage and that before age 16, another 19 percent experienced the dissolution of their parents' marriage. When parental death and other causes of family disruption are also considered, 36 percent of the children in that age cohort had been separated from at least one parent before they reached age 16, compared with 22 percent of children born two decades earlier.

In all, 27 percent of nonmarital births between 1970 and 1984 were to cohabiting couples; the proportion was 40 percent for Mexican Americans, 29 percent for non-Hispanic whites and 18 percent for blacks. About two-thirds of cohabiting couples who had children during the 1970s eventually married; however, before these children reach age 16, 56 percent of them are likely to experience the disruption of their parents' marriage, in comparison with 31 percent of children born to married parents.

Overall, about half of all children born between 1970 and 1984 are likely to spend some time in a mother-only family, and more than half of these children reach age 16 without having had a stepfather.

For most children, living in a single-parent family is not a brief, transitory situation. Only 36 percent of children whose parents separate or who are born to an unmarried mother become part of a two-parent family within five years.

Introduction

The family experience of children has changed dramatically over the last several decades. As Andrew Cherlin recently emphasized, marriage and parenting have become increasingly separated because of marital disruption and out-of-wedlock childbearing.[1]

These changes have had a profound impact on the economic well-being of children and women,[2] but they also appear to have consequences for children's later life.[3] The present analysis uses data from the National Survey of Families and Households (NSFH) to further document the nature of children's experience in single-parent families. The NSFH, with 13,017 respondents, was conducted between March 1987 and May 1988. In addition to a nationally representative sample of 9,643 persons aged 19 and over, it included an oversample of single-parent families, stepfamilies, recently married couples, cohabiting couples and minorities. Interviews averaged about one hour and 40 minutes.[4] Among the data collected on childhood history were the ages at which respondents were living with parents and other relatives, and the reasons for reported separations from parents.

After using the childhood histories reported by the survey respondents to trace historical increases in marital disruption and decreases in parental mortality, we examine the marital and cohabitational status of the parents of children born recently by comparing each woman's birth, marital and cohabitation histories. In the final section, we consider the proportion of children with experience in a single-parent family who later in childhood have a stepfather.

Trends in Family Experiences

For our present purposes, it is useful to look at the broad sweep of change in family structure across cohorts. As others have estimated from examination of vital statistics data, the incidence of family disruption during childhood did not change much during the first half of the century—declines in parental mortality were offset by increases in marital disruption.[5] The data shown in Table 1 provide the first direct documentation of these patterns across birth cohorts. About 75 percent of children in birth cohorts through the 1950s lived continuously with both natural parents through age 16. Nonetheless, a revolution in the nature of separation from parents was occurring: Marital disruption tripled even as parental death declined by two-thirds. Before they were 16 years old, 14 percent of the cohort born prior to 1930 had lost at least one parent, compared with five percent of persons born in the 1950s and 1960s. However, the dramatic increases in both marital disruption and nonmarital fertility that occurred during the 1960s brought about a watershed in family experience. In all, 10 percent of children born between 1960 and 1968* were born outside of marriage, and 19 percent experienced the disruption of their parents' marriage before reaching age 16.

A very important methodological check on these findings can be provided by comparing the data for the 1960–1968 birth

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*Because the NSFH is a sample of persons 19 and over, 1968 is the last cohort fully represented in our sample.

Table 2. Percentage distribution of births, by marital status of mother, and percentage of nonmarital births that are to formerly married women, according to selected characteristics of the mother, 1970–1984

Characteristic	Mother's marital status*				Nonmarital births to formerly married women‡
	Married	Never-married	Formerly married†	Total	
Total	**81**	**14**	**6**	**100**	**28**
Race/ethnicity					
Non-Hispanic white	90	5	5	100	46
Black	45	47	8	100	15
Mexican American	75	20	5	100	22
Education (yrs.)					
<12	64	26	10	100	28
12	81	14	5	100	28
13–15	86	10	3	100	31
≥16	95	3	1	100	29
Age at birth					
<20	55	42	3	100	7
20–21	76	19	4	100	22
22–24	85	10	5	100	33
≥25	89	5	6	100	57

*In Tables 2–4, based on comparison of births reported by female respondents with reported marital history.

†Separated, widowed or divorced.

‡Percentages are calculated from unrounded numbers and therefore differ somewhat from the figures that would be derived using data in this table.

cohort derived from the NSFH with our earlier estimates for that cohort, based on birth and marital histories provided by women in the June 1985 Current Population Survey (CPS).[6] In that work, we treated each birth as a record and then located it within the marital history of the mother. It was therefore possible, by using a number of assumptions, to estimate whether or not a birth occurred outside of marriage and whether the parents had separated before the child reached age 16.

The CPS estimates are almost identical to those based on the reports of NSFH respondents. As Table 1 shows, 34 percent of the 1960–1968 cohort from the NSFH reported separation from at least one parent before age 16 because either one or both parents died, the parents separated or divorced or the birth was nonmarital. Likewise, the estimate from the June 1985 CPS is 33 percent (necessarily excluding maternal mortality, which is about one percent in the NSFH data for this cohort). Estimates derived from both the CPS and the NSFH data place the proportion of children born outside of marriage at 10 percent. These comparisons provide evidence of the quality of both data sources and of the accuracy of indirect procedures for estimating this information on the basis of mothers' marital and birth histories.

Nonmarital Births

Nonmarital fertility continues to be a very important factor in the creation of single-parent families: Almost a quarter of births in 1985 were to unmarried women.[7] We can examine recent nonmarital fertility in detail by comparing birth and marriage histories from the NSFH. Table 2 shows, by mother's race or ethnicity, education and age, the proportion of births in 1970–1984* that occurred before first marriage or during marital separation.†

In the 1970–1984 period, 20 percent of all births were to women who were not married at the time of the birth. Nonmarital births accounted for 10 percent of births to non-Hispanic whites, 55 percent of those to blacks and 25 percent of those to Mexican Americans. Table 2 indicates sharp differences by mother's education in the proportion of children born out of wedlock: Nonmarital births made up 36 percent of births to women who had not completed high school, but only four percent of those to college graduates. Whatever the link between a mother's education at the time of the interview and her early fertility,[8] part of the disadvantage faced by children born out of wedlock is clearly associated with the markedly lower educational attainment of their mothers.

Nonmarital births also vary greatly according to the mother's age. Forty-five percent of all births to teenagers were to unmarried women, compared with 11 percent of those to women aged 25 or older. The proportion is high among teenagers because few adolescents are married. Nonetheless, it is a mistake to think of unmarried motherhood as being primarily a teenage issue. The majority of nonmarital births are to women aged 20 and over, many of whom were previously married.[9]

Table 2 shows that 28 percent of nonmarital births in 1970–1984 were to previously married women. Although there were no differences by mother's educa-

Table 1. Percentage distribution of respondents, by family history prior to age 16, according to birth cohort, National Survey of Families and Households, 1987–1988

Family history	Pre-1930	1930–1939	1940–1949	1950–1959	1960–1968
Lived continuously with both parents	75	76	78	75	64
Did not live continuously with both parents because of*					
Parental death	14	10	6	5	5
Marital disruption	4	5	8	11	19
Nonmarital birth	4	5	5	6	10
Other†	3	4	3	3	3
Total	100	100	100	100	100

*Reason for first such separation experienced.

†Includes parental illness, inability of parent to care for respondent, leaving home to be "on own" and other responses.

Note: In this table and Tables 2 and 3, totals may not add to 100 because of rounding.

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*The period covered is limited to 1970–1984 because the NSFH sample included respondents under age 19 only if they were married. Births to women under age 19 at the time of survey are not represented if the mother had not married or if she had married and separated.

†Marital status detail for nonmarital births is not available from vital statistics, but the proportion of births that were nonmarital is 19 percent in the 1978 vital statistics (see: National Center For Health Statistics, "Final Natality Statistics, 1978," *Monthly Vital Statistics Report*, Vol. 29, No. 1, 1980), compared with 18 percent of births between 1977 and 1980 in the NSFH data. The nearly identical figures demonstrate the validity of the NSFH estimates.

Table 3. Percentage distribution of births, by mother's marital status and, for unmarried mothers, cohabitational status; and percentage of nonmarital births that are to cohabiting women, according to selected characteristics of the mother, 1970–1984

Characteristic	Married	Not married*		Total	Nonmarital births to cohabiting women†
		Not cohabiting	Cohabiting		
Total	**81**	**14**	**5**	**100**	**27**
Race/ethnicity					
Non-Hispanic white	90	7	3	100	29
Black	45	45	10	100	18
Mexican American	75	15	10	100	40
Education (yrs.)					
<12	64	25	11	100	31
12	81	14	5	100	26
13–15	86	11	3	100	21
≥16	95	3	1	100	27
Age at birth					
<20	55	35	10	100	22
20–21	76	17	7	100	30
22–24	85	11	4	100	30
≥25	89	8	3	100	30

*Includes separated women.

†Percentages are calculated from unrounded numbers and therefore differ somewhat from the figures that would be derived using data in this table.

tion, this proportion varied markedly by race and mother's age. Births to separated or divorced women constituted 46 percent of out-of-wedlock births to non-Hispanic whites, compared with 15 percent of those to blacks. These differences reflect both much lower rates of marriage among black women and much higher rates of fertility among never-married blacks.

Cohabitation and Nonmarital Births

At the same time that nonmarital fertility has increased, the boundaries of "marriage" have become less distinct because of premarital cohabitation. Almost half of persons younger than 35 have cohabited at some time in their lives,* and the proportion of persons entering first marriages who cohabited before marrying quadrupled—rising from 11 percent to 44 percent—between the early 1970s and the early 1980s. About two-thirds of recent second marriages were preceded by cohabitation.[10] Thus, it has become increasingly likely that a child born nonmaritally is not born into a single-parent family. In many cases, the father is present in the household, and the parents will eventually marry—a pattern that has become the norm in Scandinavia.[11] Whether we should regard such births in the United States as any different from marital births remains an open question.

We tend to think of cohabitation as involving a couple without children. In fact, the March 1987 CPS[12] reports that 45 percent of cohabiting households (defined as those with unrelated adults of opposite sexes) included children. According to NSFH data, 41 percent of cohabiting couples had children with them, and 15 percent had had a child after they had begun living together.

The role of cohabitation in nonmarital fertility is illustrated in Table 3, which presents the proportions of all births and of nonmarital births that were to cohabiting parents. Although only five percent of all births since 1970 were to cohabiting parents, this represents 27 percent of all births to unmarried women. While the proportion of nonmarital births accounted for by cohabiting women does not vary by mother's age among those who were 20 or older when they gave birth, it differs considerably by race and education.

Among non-Hispanic whites, 10 percent of all births were nonmarital, and of these, 29 percent were to cohabiting parents. Of all births to blacks, 55 percent were nonmarital, and 18 percent of these were to cohabiting couples. Among Mexican Americans, the proportions were 25 percent and 40 percent. Hence, births to cohabiting parents account for most of the difference in nonmarital fertility between non-Hispanic whites and Mexican Americans, with 93 percent of non-Hispanic white children and 85 percent of Mexican Americans being born into two-parent families. The comparatively low proportion among blacks of nonmarital births to cohabiting couples has widened the black-white differences in the proportion of children living in two-parent families.

Mother's education is negatively related both to the proportion of births that were nonmarital and to the proportion of nonmarital births accounted for by cohabiting couples: Of births to high school dropouts, 36 percent were nonmarital, and 31 percent of these births were to cohabiting parents. In comparison, only 14 percent of births to women with 1–3 years of college were nonmarital, and 21 percent of these were to cohabiting couples. (Because the proportion of births that are nonmarital is very low among college graduates, the higher proportion of such births that are to cohabiting couples should be given little attention.)

Thus, a substantial proportion of nonmarital births are to two-parent families. The implications of this finding are not clear, however, because of the volatility of cohabitational unions. Many cohabiting parents will marry, but many will break up, either before or after marriage. We noted in our earlier analyses that approximately 60 percent of all first cohabitations are followed by marriage;[13] the proportion is similar for the cohabiting parents of the children represented in Tables 2 and 3. Two-thirds of cohabiting women who gave birth during the 1970s married their partner. In most cases, therefore, premarital birth may be little more than an artifact of the timing of a ceremony. Nevertheless, childbirth does not seem to be a strong precipitating factor in marriage among cohabiting couples. The proportion marrying after a birth is only slightly higher than the proportion of all cohabiting couples who eventually wed and one-third of couples who have a child while cohabiting do not marry.

Further, marriage obviously does not guarantee a two-parent family throughout childhood. The risk of separation from one or both parents is high even for children born to married couples, and marital disruption rates are much higher among couples who cohabit before marriage than among those who do not.[14] Life-table estimates (not shown) suggest that 56 percent of children born to cohabiting couples who later marry will experience the disruption of their parents' marriage, compared with about 31 percent of children born to married parents. When this proportion is combined with the one-third whose cohabiting parents break up without marrying, it appears that about three-quarters of children of cohabiting couples will spend some time in a single-parent home. Therefore, although cohabitation clearly adds years to the two-parent experience of such children, relatively few children of cohabiting couples will reach age 16 in an intact family.

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*Because this is often a short-lived state, rapidly either turning into marriage or disrupting, lifetime experience is much higher than the proportion cohabiting at any given time. The prevalence of current cohabitation peaks at about one-sixth of the never-married at ages 25–34 and at about one-quarter of the previously married at ages under 35.

Single-Parent Families

Table 4 presents estimates of children's experience with single-parent families and remarriage, based on all births during the 1970–1984 period. We treated each birth reported in a female respondent's fertility history as a unit of observation.[15] Life-table procedures were used to take into account that some of the children born in this period have not yet reached age 16. By comparing the dates of birth to the mothers' marital history, we calculated the child's probability at each age of experiencing the breakup of a mother's marriage. We then combined these age-specific probabilities to estimate cumulative experience by each age. Thus, the 44 percent at the top of the first column represents the proportion that would be expected to have a parental marital disruption before age 16 (or to be born to an unmarried mother) if a cohort were to conform to the age-specific probabilities experienced by children born between 1970 and 1984. The next two columns were based on similar procedures for calculating probabilities of mothers' remarriage (or marriage) by duration since marital disruption (or premarital birth).

This estimate of 44 percent is slightly lower than the 49 percent we calculated for the late 1970s from the 1980 CPS. However, our estimate from the June 1985 CPS for the early 1980s (43 percent) closely agrees with the NSFH figure. Although we need to explore further the source of the slightly higher estimate from the 1980 CPS, analyses of trends provide no evidence of a decline between the late 1970s and early 1980s within either the 1985 CPS or the NSFH data. Allowing for underreporting of marital disruption[16] and for the nature of the estimation procedure, "about half" remains an appropriate estimate of the proportion of all children who are likely to spend some time in a single-parent family. Rates are much higher among blacks; only a small minority of black children, in comparison with about two-thirds of whites, live in a two-parent family from birth to age 16.

For most children, living in a single-parent family is not a brief, transitory situation on the way to a reconstituted family. Only 36 percent of children whose parents separate or who are born to an unmarried woman become part of a two-parent family within five years (44 percent among non-Hispanic whites and 23 percent among blacks). For the majority of children—white and black—who live in single-parent families, this situation is likely to persist for the remainder of childhood.

By combining the children's age when their parents separated with life-table estimates for the remaining years to age 16 (from the midpoint of age intervals), we find that overall, 53 percent of these children will remain in a single-parent home throughout childhood. Among children born to an unmarried woman, 35 percent will remain in a mother-only family through age 16; this will be the case for 31 percent of those whose mother was cohabiting and 36 percent of those whose mother was not cohabiting when they were born. The probability that the mother will remarry is strongly age-dependent, so younger children are much more likely to have a stepfather before age 16 than are older ones. Even so, of the children whose parents separate before the child is five years old, 41 percent remain without a stepfather until age 16; that proportion increases to 65 percent for children who are 5–9 when their parents separate and to 86 percent among those who experience parental marital disruption after age 10.

Table 5 shows the proportion of NSFH respondents born between 1950 and 1968 who experienced a parental separation or divorce and whose mother did not remarry before the child reached age 16; the longer period was used to provide more cases for analysis. Adjustments for compositional differences by race or ethnicity, education and cohort did not alter the patterns by marital status of mother and age of child at separation (not shown). Because of black women's relatively low marriage rates,[17] black children were much more likely than non-Hispanic white children or Mexican-American children to remain in mother-only families throughout childhood (81 percent vs. 51 percent and 57 percent).

Children born to women with higher education were more likely to remain in a mother-only home throughout childhood than those born to women with less education. It is tempting to interpret these differences in terms of the greater economic independence that women achieve with education; however, the effect of education on the likelihood that a woman would remarry reversed from negative to positive between the late 1970s and the early 1980s.[18]

Table 4. Percentage of respondents who experienced a single-parent family before age 16, and percentage of these who joined a two-parent family within five years and within 10 years of entry into a single-parent family, by race/ethnicity, 1970–1984

Race/ ethnicity	Experienced single-parent family	Joined two-parent family	
		Within five yrs.	Within 10 yrs.
Total	**44**	**36**	**51**
Non-Hispanic white	36	44	61
Black	80	23	35
Mexican American	43	34	59

Conclusion

Our analysis of data from the NSFH indicates that nonmarital fertility continues to be a major factor in the formation of single-parent families. However, births to previously married women are a substantial component of out-of-wedlock fertility, particularly among non-Hispanic white women. Changes in the proportion separated have resulted from trends in both marital disruption and remarriage. These changes should be explored in relation to the sharp increases in nonmarital fertility

Table 5. Percentage of respondents who experienced parental separation or divorce and who remained in a single-parent family for the duration of childhood by selected characterics, 1950–1968

Characteristic	%
Age*	
0–4	44
5–9	56
10–14	73
Race/ethnicity	
Black	81
Non-Hispanic white	51
Mexican American	57
Other	56
Mother's education (yrs.)	
<12	47
12	57
13–15	57
≥16	66
Cohort	
1950–1959	58
1960–1968	56

*At entry into single-parent family.

that have occurred among white women since the mid-1970s.

Recent trends in cohabitation have further blurred the connection between marriage and childbearing. Over a quarter of all children born to unmarried women are born to cohabiting couples. This may be relevant to the recent increases in nonmarital fertility among whites, but it also calls for a serious exploration of how these children's lives may differ from those of children living with parents who are married. The parents of many will marry, but a sizable proportion will not. Many of the parents who marry will dissolve the marriage before the child reaches age 16, but this is true of parents who were married when they had their child as well. The NSFH was the first national study to collect detailed histories of cohabitation. If we are to increase our understanding of evolving family patterns, future investigations of marriage must include measures of cohabitation.

Finally, living in a mother-only family is not a transitory situation en route to a "reconstituted family" for most of the children involved. Analyses of both the nature and the consequences of the increasing diversity of childhood family experience must take this basic fact into account.

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Early Sexual Activity Among Adolescents In Small Towns and Rural Areas: Race and Gender Patterns

By Cheryl S. Alexander, Margaret E. Ensminger, Young J. Kim, B. Jill Smith, Karin E. Johnson and Lawrence J. Dolan

Summary

A 1987 survey of 758 eighth-grade students from three rural counties in Maryland revealed that 61 percent of males and 47 percent of females have engaged in sexual intercourse, and that 77 percent of black students and 40 percent of whites have ever had intercourse. A logistic regression analyzing the effects of race and gender shows that the odds that young black teenagers would have had intercourse are over five times those for whites, and that the odds for males are about twice those for females. The introduction of developmental, individual, academic and behavioral factors into the regression model has little effect on these odds ratios.

Separate logistic analyses of four subgroups—white males, white females, black males and black females—reveal no consistent associations between sexual activity and the factors examined. For example, such types of problem behavior as cigarette smoking and use of alcohol or certain other drugs are associated with the likelihood of sexual activity, but the specific type of behavior involved differs by subgroup: Cigarette smoking is related to an increased likelihood of sexual activity just among white females, while alcohol consumption is associated with sexual experience among black females and white males only. Use of drugs other than marijuana or alcohol is linked to a 5–9 times greater risk of sexual activity among whites, but not to any significantly increased risk among blacks, whereas living in a town (rather than in the country) is significantly associated with the likelihood of sexual intercourse among both white and black males, but not among females of either race. Frequent cruising (driving around with no particular destination) has an important impact on the likelihood of intercourse among all whites and among black males, but not among black females.

The odds of engaging in intercourse for white females who often cruised around at night with no particular destination were four times as high as for those who did not, five times as high for white males and 13 times as high for black males.

Introduction

The initiation of sexual intercourse during the early teenage years is known to be associated with increased risks of teenage pregnancy and sexually transmitted diseases. Much of the research on adolescent sexual behavior has focused on populations seen to be at greatest risk, primarily minority women in large urban centers.[1] Less is known about the factors that influence early sexual activity among male and female adolescents who live in small towns and rural communities.

Racial and gender differences in the timing and prevalence of coital behavior are well established.[2] Despite a decrease since the 1970s in black-white differences in the age at first intercourse, black females are still likely to have intercourse at younger ages than white females.[3] Findings from a survey of a nationally representative sample of never-married women conducted in 1982 indicated that 28 percent of blacks had experienced sexual intercourse by age 15, compared with 18 percent of whites; over 40 percent of black females were sexually active by age 16, compared with 27 percent of whites.[4] Like their female counterparts, black males are more likely than whites to engage in sexual activity at a young age. In the National Longitudinal Survey of Youth, nearly 60 percent of black male respondents reported having had sexual intercourse by age 16, and 90 percent reported first intercourse to have occurred by age 20.[5] Overall, males were more likely than females to be sexually active, and black males reported greater sexual activity than white males.

A number of theories have been advanced to explain racial and gender differences in adolescent sexual behavior. Some social scientists have classified early coitus as a kind of problem behavior—that is, "behavior that is socially defined as a problem, [as] a source of concern or as undesirable by the norms of conventional society . . . [such that] its occurrence usually elicits some kind of social control response."[6] Problem behavior, such as sexual activity or substance use, is thought to be a consequence of limited involvement with social institutions such as school, family and churches, poor academic motivation and rebellion against authority. Sexually active, young adolescents are seen to have strong allegiances to peers and weak ties to conventional groups (including family and schools), and are more likely than their peers who are not sexually active to engage in other problem behavior (for example, alcohol and drug use).[7]

To the extent that certain ethnic or gender groups are closely tied to conventional norms, differences in sexual behavior may

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be attributed to variations in levels of social control. One study of patterns of sexual activity by race and gender found that the initiation of coitus among white adolescent females is associated with weak social controls, whereas among white males and black females, measures of physical attractiveness and pubertal development predict the start of sexual behavior.[8]

Biological explanations for racial differences in sexual activity are a relatively recent addition to the literature.[9] One study suggested that among black females, earlier age at menarche increases the risk of sexual intercourse, and that among black female high school students, pubertal development (as measured by breast development, pubic hair staging and menstrual status) determines the initiation of coitus.[10] Such arguments fail, however, to account for racial differences among males, where variations in pubertal development are more individual than group related, or in explaining gender differences in sexual activity, since females typically reach puberty at an earlier age than males. Additionally, there is evidence that among young black urban males, prepubertal sexual intercourse is not uncommon.[11]

The economically disadvantaged status of many black adolescents and the lack of opportunity for educational and occupational mobility may partially explain racial differences in early sexual activity.[12] Factors such as performing poorly in school, living in a disrupted or single-parent family and coming from a family with little educational background have been linked to higher rates of sexual intercourse, leading some to conclude that social disadvantage is one reason why black adolescents initiate sexual activity earlier.[13]

Finally, attitudes about behavior may vary by race and gender.[14] Despite a general liberalization in sexual mores over the past two decades, meanings attached to sexual experience by young adolescents may differ for whites and blacks, and for males and females. For some groups, early sexual behavior may represent a form of rebellion or deviance, while for others it may signal a transition to adulthood, as well as to enhanced self-esteem and social competence.[15] Certain factors linked to early sexual activity among adolescents, including family composition, economic circumstances and feelings about school, have been thought to explain racial differences in sexual experience. Others, like substance use and the behavior of peers, may contribute to gender differences in the onset of sexual activity.

Most research on adolescent sexual behavior has focused on nationally representative samples. As a result, community differences in norms and sexual behavior have not been taken into account. Since blacks and whites usually reside in separate neighborhoods, community differences may influence the racial differences that are observed. One study found neighborhood differences in sexual behavior among black female adolescents living in Chicago.[16]

In this article, we will examine early sexual activity and factors associated with it among black and white young people living in the same rural communities and small towns, and attending racially integrated schools. We assess the extent to which intercourse is related to developmental, individual, academic and behavioral factors, and identify the factors associated with racial and gender differences.

Methodology

The analysis is based on data from the first year of a prospective, longitudinal study of health-compromising behavior among rural adolescents. (Such types of behavior are defined as those that are generally initiated during the teenage years and that have long-term health and social consequences and include the use of tobacco, alcohol and drugs; risk-taking behavior that may lead to injury; and unprotected sexual intercourse.) The study population comprised all eighth-grade students enrolled during 1986–1987 in seven public schools in three Maryland counties. Written informed consent was obtained from both parents and students. Despite the creation of local advisory boards to review survey material and monitor the administration of the study, small but vocal groups objected to questions that asked teenagers about their sexual experiences. Parental refusal rates ranged from 20 percent to 35 percent in the study counties.

The 758 students who participated represented 64 percent of the eligible population. The participants did not differ significantly in terms of race, gender or academic achievement from the total cohort of eighth-grade students.[*] Fifty-three percent were male, and 37 percent were black. Students answered a questionnaire that included items on their use of cigarettes, alcohol or marijuana; their relationships with their peers and parents; their feelings about school; and their general health and psychological well-being. Students rated their own pubertal development during a brief health screening examination. Information on standardized test scores and grades was obtained from school records.

Early sexual activity for these eighth graders was defined as ever having had sexual intercourse. Use of cigarettes, alcohol or marijuana in the 30 days preceding the survey was considered an indicator of problem behavior. In addition, because use of drugs other than the above was infrequently reported, an "other drug use" index was created by combining ever-use of cocaine with use of speed, amphetamines, downers or tranquilizers within the preceding 30 days. Peer norms concerning these types of health-compromising behavior were measured by five questions that asked whether all, most, some or none of the students' friends had had sexual intercourse, smoked cigarettes, drunk alcohol, used marijuana or used other drugs. On the basis of the students' responses, an index of these types of problem behavior was created, with scores ranging from 4 to 20. The frequency with which students rode around in cars without going anywhere in particular (known as cruising) was included as a measure of sexual opportunity: respondents were asked to report how often they went cruising, from not at all to several times per week.

Two developmental characteristics were considered: cohort status and pubertal development. Students born during 1972, 1973 or 1974 were considered to be at an appropriate age for eighth grade; those born in 1970 or 1971 were designated as old for their cohort. For females, pubertal development was measured with the Pubertal Development Scale (PDS), developed by Anne Petersen and colleagues.[17] The young women rated their development on a four-point scale (with 1 denoting no development and 4 representing completed development) in areas such as growth spurt, pubic hair development, breast development, skin change and body shape or curviness. (The PDS was evaluated in a study correlating reported self-assessments with a physician's rating of physical development, and was proved fairly accurate.[18]) A parallel scale was developed for males, with items addressing growth spurt, facial hair, pubic hair and penis development. The Cronbach's alpha coefficient for the scale among our study's females (0.79) indicated moderate internal consistency, as did the coefficient for the male scale (0.81).

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[*] Frequency distributions of race and gender among participants were similar to those for the entire eighth grade, and there were no significant differences in the means of the California Achievement Ability Test between the two groups.

Satisfaction with one's body image, particularly with one's physical attractiveness, has been hypothesized to influence sexual experience. Petersen's nine-item Body-Image Scale was used to measure the respondents' perceived comfort with their physical development and attractiveness.[19] For example, one item read: "I think that girls [or boys] find me attractive"; responses ranged from "does not describe me at all" (scored as 1) to "describes me very well" (6). A five-item anger scale (adapted from the Woodlawn Study)[20] served as an indicator of rebellion. For example, students were asked how frequently they lost their temper; the range of answers was from "not at all" (scored as 1) to "very much" (5).

Bonding to each parent was among the personal characteristics analyzed. It was assessed by how much the adolescents reported sharing secrets with each parent, how much they believed the parent understood them and the number of topics (such as dating) about which they asked the parent for advice. Family structure, defined as the students' current household living arrangement, included whether they lived with two parents, a single parent, a parent and other adults in the household or in other arrangements (for instance, with grandparents). Residence was determined from the teenagers' reports of living in a town, out of a town but in a community, or on a farm.*

Studies have shown that adolescents who do poorly in school are more likely to report having had sexual intercourse than are their higher achieving counterparts.[21] The two indicators of academic success used in this study were IQ, as measured by the California Cognitive Skills Test, and academic performance, as indicated by the respondents' grades in math and English at the end of eighth grade.

Our analyses address two major questions. First, what is the magnitude of racial and gender differences in sexual activity after we adjust for other developmental, individual, academic and behavioral factors? Second, within gender-race groups, what factors are associated with early sexual activity, and how do they differ across these groups?

To answer the first question, we perform a series of multiple logistic regression analyses (with sexual activity denoted as 1 if the student reported having had sexual intercourse and 0 otherwise, and then regressed on the variables shown in Table 1). Odds ratios are calculated for race and gender groups, and a series of logistic regression models is used to estimate the effects of race and gender and their interaction with sexual activity, as well as to assess changes in the magnitude of race and gender effects when a variety of covariates are taken into account. If a beta coefficient produced in the regression analysis is positive, the variable is associated with an increased likelihood of sexual intercourse; similarly, a negative value for the coefficent indicates that the variable is associated with a decreased likelihood of sexual intercourse. We then use backward selection to estimate a reduced model containing only the statistically significant variables. We studied the second question by performing separate regression analyses for each race and gender group, using the same set of variables that proved significant in the first set of analyses. Equations were rerun for each subgroup, using backward selection to achieve efficient models.

Results

Table 1 shows the proportion of respondents with the various characteristics included in the regression equations, by race and by gender. The scales for pubertal development, anger, peer problem behavior, paternal and maternal bonding, IQ and academic performance were categorized in quartiles; the proportion of students in the uppermost quartile is represented in the table. Since the items in the pubertal development scale are different for boys and girls, pubertal development quartiles are presented by race only. The measure of body image was not associated with sexual activity for any of the subgroups, and thus is not included in the analyses presented here.

As can be seen in Table 1, the racial difference in sexual activity is greater than the gender difference. Seventy-seven percent of black students report having had sexual intercourse, compared with 40 percent of whites; in contrast, 61 percent of males and 47 percent of females were sexually active. Smaller racial differences are observed in reports of cigarette smoking, alcohol use and marijuana use. The difference is substantial, however, for other drug use: Ten percent of white students report having used such drugs as tranquilizers, amphetamines or cocaine, compared with five percent of black students. Black eighth graders are likely to be older than their white peers, and are more likely than whites to live in towns or to come from a single-parent household. Approximately half of black eighth graders report cruising several times each week or more, compared with 30 percent of white students.

Table 1. Percentage of respondents with various characteristics, by race and gender

Characteristic	Race		Gender	
	Black (N=283)	White (N=475)	Male (N=402)	Female (N=356)
Problem behavior				
Sexually active	77.4	39.8	60.6	46.6
Smoked cigarettes*	20.6	28.7	24.9	26.5
Used alcohol*	43.1	43.2	46.5	39.4
Used marijuana*	11.8	8.5	12.1	7.0
Used other drugs*	4.6	10.1	9.0	7.0
Peer problem-behavior scale†	23.6	20.0	29.2	21.6
Frequent cruising	50.9	29.6	38.3	36.7
Developmental				
Older cohort	58.0	26.9	39.0	25.4
Pubertal development scale†				
Male	25.3	23.8	na	na
Female	27.0	24.6	na	na
Personal				
Lives in town	67.1	39.2	48.0	51.4
Single-parent household	31.4	15.6	23.0	19.8
Anger scale†	30.5	23.5	30.6	21.1
Paternal bonding scale†	28.4	23.8	28.1	14.0
Maternal bonding scale†	28.5	24.3	22.1	37.4
Academic				
IQ†	6.4	36.7	25.8	25.1
Math and English scale†	14.4	32.6	18.8	25.8

*Over the 30 days preceding the survey.

†Percentage in upper quartile.

Note: na=not applicable.

There was little racial difference in the percentage of young people in the upper quartile of the peer problem-behavior scale. The young black teenagers are also more likely to fall in the upper quartile of the anger and father-bonding scales, and less likely to be in the upper quartile for IQ or math and English grades.

The young women are less likely than the young men to report having engaged in sexual activity or in alcohol or marijuana use. The proportion of males and females who report smoking cigarettes are similar. As expected, a greater proportion

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*In the three study counties, there are many unincorporated communities with designated names. Students living in these areas considered themselves to be members of a community, although they may have been living miles from their nearest neighbor.

Table 2. Estimated effects of various characteristics on the likelihood that young teenagers will have engaged in sexual activity, four logistic regression models

Characteristic	Model 1		Model 2		Model 3*		Model 4†	
	Beta	Odds ratio	Beta	Odds ratio	Beta	Odds ratio	Beta	Odds ratio
Race	1.756 (0.179)	5.79	1.671 (0.236)	5.31	1.628 (0.336)	5.09	1.742 (0.250)	5.71
Gender	0.789 (0.165)	2.20	0.730 (0.197)	2.08	0.952 (0.297)	2.59	1.053 (0.227)	2.87
Race-gender interaction			0.191 (0.365)	1.22	0.196 (0.483)	1.22		
X^2	117.24		117.28		252.91		246.49	
Degrees of freedom	2		3		18		8	
N	731		731		606		606	

*Model 3 contains the variables for cigarette smoking; alcohol, marijuana or other drug use; peer problem-behavior; frequent cruising; older cohort; pubertal development; living in town; living in a single-parent household; the anger scale; the paternal and maternal bonding scales; IQ; and the math and English scale. Of these, cigarette smoking, alcohol use, other drug use, frequent cruising, living in town and IQ were significantly associated with the odds of sexual activity ($p<0.05$).

†Model 4 contains only the variables determined in Model 3 to be statistically significant.

Notes: In tables 2 and 3, standard errors are shown in parentheses. Odds ratios indicate the impact of the variable on the likelihood that the teenager will engage in sexual intercourse.

of females than of males fall in the upper quartile for maternal bonding, and the reverse is true for paternal bonding. Although the proportions of males and females who fall in the upper quartile of IQ are similar, a difference emerged in the proportion falling in the upper quartile of math and English grades (13 percent of males vs. 26 percent of females).

Table 2 shows that when sexual activity is analyzed by race and gender alone (model 1), and then controlled for race-gender interactions (model 2), odds ratios for both race and gender change only slightly: The odds that black eighth graders have engaged in sexual intercourse remain more than five times the odds that their white counterparts have done so, once the effects of gender are controlled for; likewise, the odds for the young men remain about twice the odds for the young women.

The introduction of other covariates (model 3) diminishes the odds ratio for race and increases that for gender somewhat; substance use, frequent cruising, area of residence and IQ represent significant contributing factors. When nonsignificant covariates are eliminated from the equation, differences between the adjusted odd ratios (model 4) and the unadjusted observed odds ratios (model 1) are minimal. This result suggests that race and gender effects are influenced relatively little by developmental, individual, academic and behavioral factors.

In order to avoid having to include numerous interaction terms between these significant factors and gender or race (which would be necessary if we were to attempt analysis of all four subgroups in one model), we instead ran a separate regression model for each race and gender subgroup. Table 3 displays the results. Two variables show clear racial and gender differences: The odds that the youths who used drugs other than alcohol or marijuana had had sexual intercouse are five times higher than those of nonusers among white females and nine times greater among white males, but the likelihood is no greater among black students. In addition, among both white and black males, living in a town is significantly associated with the likelihood of having had sexual intercourse (odds ratios of 2.1 and 7.4, respectively), but this factor shows no association among white or black females.

Frequent cruising emerged as an important indicator of the likelihood of having engaged in sexual activity. The odds are 3.7 times as high among white females who cruised, 4.9 times as high among white males who cruised and 13.3 times as high among black males who cruised; only among black females is such behavior not linked with sexual intercourse. Alcohol use in the previous 30 days, on the other hand, is associated with reports of sexual activity among white males and among black females (odds ratios of 3.2 and 9.7, respectively), while high IQ is significantly related to a decreased likelihood of sexual intercourse in these two subgroups (odds ratios of about 0.3 and 0.1, respectively).

Physical development also plays a role among white females and black males: Being older than others in the same educational cohort is associated with the likelihood of sexual intercourse among white females (odds ratio of 4.6), and advanced pubertal development (as indicated by being in the upper 25 percent of the pubertal development scale) is a significant factor among black males (odds ratio of 9.2). Although the effect of pubertal development is large among black males, it is negligible in the other subgroups. Among black females, the odds of sexual intercourse associated with high reported levels of anger are 3.5 times those for medium or low levels of anger.

Use of cigarettes, alcohol or drugs is generally the strongest correlate of the likelihood of sexual intercourse among white males and females and among black females. None of these types of behavior are significantly associated with the likelihood of sexual activity among black males. Drug use is not a significant predictor, although the coefficient for drug use is large, as is the standard error, indicating that while few black males reported having used drugs, those who had generally also reported engaging in sexual intercourse.

The model of sexual activity using this set of explanatory variables fits data from white students better than those from blacks, and data from females better than those from males. Data from white females produced the best-fitting model, while data from black males produced the poorest fit.

Discussion

Over half of the eighth graders in our study reported having had sexual intercourse. Consequently, among these adolescents (who were, on average, 13 years of age), a substantial proportion are potentially at risk of pregnancy or acquisition of sexually transmitted disease. Information from the state health department corroborates the high risk: Data on adolescents under 15 years of age indicate that levels of teenage childbearing and rates of gonorrheal infection in two of the three counties included in this study approximate or exceed those found in metropolitan Baltimore. (Baltimore is often cited as the city with the highest teenage birthrate in the United States.) For example, the birthrate in 1986 was 4.6 per 1,000 women 10–14 years of age in the city of Baltimore and 6.8 per 1,000 in one of the study counties.[22]

Rates of sexual activity among white students in this study are considerably higher than those reported by other investigators.[23] To evaluate the quality of our responses, we compared reports on sexual intercourse from eighth-grade students with reports from the same students when they were in ninth grade. Overall, three percent of those who in eighth grade said that they had had sexual intercourse once and four percent who reported having had sex two or more times claimed in the ninth-grade survey that they were virgins. It is possible that students who reported a single episode of sexual experience in the eighth-grade survey but reported no such experience in the ninth-grade survey had confused other types of sexual behavior, such as heavy petting, with sexual intercourse. It is unlikely, however, that eighth graders who reported having engaged in intercourse more than once had been confused.

The proportion of students who reported inconsistently on their sexual experience was identical among whites and blacks; a greater proportion of males than females gave inconsistent information (nine percent vs. five percent). Among the four subgroups, white males were the least consistent. Thus, higher rates of sexual activity among white students may be related in part to overreporting among white eighth-grade males. However, even taking into account a margin of error of 7–8 percentage points, about 40 percent of the young white males were sexually experienced.

In this study, 85 percent of black male students reported ever having had sex, a finding comparable to rates reported in Baltimore. In a 1981 survey of adolescents from two Baltimore city schools, 87 percent of black males 14 years of age and under reported having had sexual intercourse.[24] Notwithstanding the fact that some males may overreport their sexual experience, it is clear that models of the determinants of early sexual activity among blacks must target younger people, even prepubescent youth. Ethnographic studies of black teenagers in urban ghettos suggest that young black males face tremendous pressure to engage in sexual intercourse,[25] as masculinity is equated with sexual performance (such as being able to "score" with women at every opportunity).[26] A similar phenomenon may be occurring in rural communities. A greater degree of sexual activity may result from an increasing acceptance of sexual intercourse as normal behavior within this group.

Although we had anticipated finding racial and gender differences in levels of sexual activity, we had expected these differentials to diminish when other potentially explanatory variables—variables that have been widely described in the literature on adolescent sexual behavior and teenage pregnancy—were controlled for. However, our logistic regression analyses illustrate that developmental, individual, academic and behavioral factors had little impact on race and gender differentials in early sexual intercourse.

Table 3. Estimated effects of various characteristics on the likelihood that young teenagers will have engaged in sexual activity, by race and gender

Characteristic	Whites				Blacks			
	Females		Males		Females		Males	
	Beta	Odds ratio	Beta	Odds ratio	Beta	Odds ratio	Beta	Odds ratio
Smoked cigarettes†	1.423*	4.15	0.367		0.183		0.596	
	(0.537)		(0.476)		(0.909)		(1.451)	
Used alcohol†	0.584		1.160*	3.18	2.227*	9.67	0.106	
	(0.555)		(0.407)		(0.734)		(0.980)	
Used marijuana†	0.138		0.369		7.546		–0.614	
	(0.977)		(0.943)		(19.331)		(1.477)	
Used other drugs†	1.628*	5.24	2.24*	9.39	7.674		4.022	
	(0.930)		(1.15)		(17.621)		(23.921)	
Peer problem-behavior	0.078		0.966		–0.269		0.739	
	(0.625)		(0.599)		(0.862)		(1.233)	
Frequent cruising	1.304*	3.68	1.583*	4.86	0.231		2.589*	13.31
	(0.514)		(0.444)		(0.544)		(0.989)	
Older cohort	1.524*	4.59	–0.242		–0.674		0.220	
	(0.564)		(0.449)		(0.595)		(0.863)	
Pubertal development‡	0.894		0.002		0.130		2.217*	9.17
	(0.530)		(0.436)		(0.664)		(1.466)	
Lives in town	0.388		0.745*	2.10	0.077		2.008*	7.44
	(0.491)		(0.415)		(0.537)		(0.825)	
Single-parent household	0.694		–0.194		0.830		1.154	
	(0.678)		(0.593)		(0.591)		(1.084)	
Anger scale‡	0.037		–0.003		1.245*	3.47	–0.659	
	(0.678)		(0.449)		(0.734)		(0.943)	
Paternal bonding scale‡	0.154		0.174		–0.839		–0.301	
	(0.532)		(0.514)		(0.593)		(1.091)	
Maternal bonding scale‡	0.361		–0.100		0.819		0.536	
	(0.575)		(0.399)		(0.670)		(1.069)	
IQ‡	–0.806		–1.076*	0.34	–2.468*	0.08	0.641	
	(0.560)		(0.422)		(1.222)		(1.720)	
Math and English scale‡	–0.805		0.321		–0.951		0.812	
	(0.564)		(0.492)		(0.638)		(0.898)	
X^2	84.13		77.00		35.54		23.15	
Degrees of freedom	15		15		15		15	
N	180		204		119		103	

*$p<0.05$. †In upper quartile. ‡Over the 30 days preceding the survey.

Note: Odds ratios are calculated only for coefficients statistically significant at $p<0.05$.

Recently, some investigators have argued that adolescents' social contexts—their schools, for example—play an important role in the determination of sexual activity; these researchers have found that black students in racially isolated schools are over three and one-half times as likely as blacks in integrated schools to be sexually active.[27] (The racial composition of the schools served as a proxy for the norm in attitudes toward and perceptions of sexual behavior.) All of the students in the present study attended racially integrated schools, although the three counties varied in the proportions of black students in their schools. In analyzing racial differences in sexual activity by county, we found that the proportion of sexually active black eighth graders was smaller in the county with the lowest proportion of black students than it was in the other two counties (59 percent vs. 67 percent and 72 percent). Small numbers prohibit further exploration of community effects. However, these findings do support a contextual hypothesis.

Living in a town, which was positively associated with early sexual activity, may simply represent greater access to potential sexual partners. Such access is particularly important for young adolescents, who have not yet reached driving age. It may also reflect a context of norms that differs from those in small communities and rural areas.

Factors associated with early sexual activity showed varying patterns of influence for race and gender subgroups. The lack of consistency across subgroups suggests that race *and* gender must be considered when early sexual activity is examined. Even when a characteristic such as problem behavior was associated with sexual activity, the specific type of behavior involved differed across subgroups: Among white females, cigarette smoking was related to an increased likelihood of sexual activity, while among black females and white males, alcohol consumption was related to sexual experience. Greater information on the social meaning attached to the use of cigarettes, alcohol and drugs would enhance our understanding of the social processes associated with early sex. Program and school staff need to be sensitive to how differences in the experiences of males and females of varying racial or ethnic backgrounds may influence early sexual behavior.

Results from this study speak to the need for further examination of factors influencing early sexual behavior among rural youth. The development of appropriate educational programs and reproductive health services for young adolescents requires a better understanding of the differences as well as the similarities, by race and gender, in early sexual experience.

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Comment

Antiprogestin Drugs: Medical and Legal Issues

By Rebecca J. Cook

The *Webster* decision of the U.S. Supreme Court,[1] one aspect of which upheld state conditions limiting delivery of late abortion services, underscores the need for safe and reliable means to perform abortion early in pregnancy.[2] The Missouri statute reviewed in *Webster* raised an additional issue in its preamble, which contained the words: "The life of each human being begins at conception."[3] The Court saw no need to address the implications of this language yet, and is prepared instead to await a judicial challenge to legislation specifically providing for state intervention on these grounds.[4] It is difficult to predict whether and to what extent the Court will find a legislative restriction on abortion early in pregnancy to be constitutional, but for many reasons, providing access to abortion at the earliest possible stage in pregnancy is advisable. Antiprogestin drugs permit a new, safe and effective means to achieve early abortion.

Antiprogestins are synthetic steroids that inhibit the activity of progesterone by blocking the cells' progesterone receptors.[5] Progesterone, a hormone necessary for pregnancy, rises in level after ovulation, and prepares the uterus for implantation of the fertilized ovum.[6] After implantation, it sustains the embryo until the placenta has formed. Antiprogestin drugs prevent implantation if fertilization has occurred. In this sense, they may be described as "last-chance" contraception. However, if implantation is complete, antiprogestins will prevent gestation of an early embryo, causing its abortion. They thus may also be described as "contragestational."[7]

Antiprogestins can act at different points along a developmental continuum before, during and after completion of implantation. The egg, which is fertilized in the fallopian tube, takes about six days to reach a place in the lining of the uterus where it begins the process of implantation,[8] which takes another 6–8 days to complete.[9] Thus, implantation is usually accomplished 12–16 days after fertilization, or about 28–32 days from the beginning of the last menstrual period.

According to its medical definition, pregnancy begins at the completion of implantation of the embryo in the woman's womb.[10] This definition has been adopted by the American College of Obstetricians and Gynecologists.[11] The Committee on Medical Aspects of Human Reproduction of the International Federation of Gynecology and Obstetrics unanimously agreed that "pregnancy is only established with the implantation of the fertilized ovum."[12] This medical definition of pregnancy coincides with medical practice regarding in vitro fertilization; in these programs, pregnancy is considered to begin at the completion of implantation of an egg fertilized outside the womb. In the United States, the loss of fertilized eggs in in vitro fertilization programs is accepted and is not considered abortion.[13] Comparable policies have been recommended in government and law reform reports in the United Kingdom;[14] Victoria, Australia;[15] Ontario, Canada;[16] and France.[17]

During the first 14 days of development, the products of the fertilized egg are variously termed the conceptus, the zygote, the blastocyst or the "preembryo."[18] After implantation, the embryo forms in the center of the conceptus, and the remaining 99 percent of the tissue gives rise to the placenta and other extraembryonic membranes.[19] The embryo develops into a fetus at about eight weeks after fertilization or 10 weeks after the last menstrual period.[20] Depending on the stage of gestation, 22–31 percent of conceptions end in spontaneous abortion, which can occur before or after implantation; such reproductive failures may range as high as 62 percent.[21]

Abortion can be artificially induced by antiprogestins before the development of the fetus.[22] When administered early in pregnancy, the antiprogestin drug RU 486 (known scientifically as mifepristone and generically as mifegyne) has been generally shown to be 85 percent effective as an abortifacient when used alone[23] and 95 percent effective when used in combination with a prostaglandin.[24] The drug, which was developed by the French-based company Roussel-UCLAF, has also been investigated in animals and humans for a variety of other health indications, including inhibition of ovulation,[25] luteal interception,[26] induced delivery following spontaneous fetal death[27] and treatment of gynecologic malignancy[28] and breast cancer.[29] It also may be used to treat Cushing's syndrome, because of its collateral antiglucocorticoid effect.[30]

In many countries (including France, where RU 486 with prostaglandin is now used widely for early first-trimester abortions), the laws controlling the availability of abortion exempt medical practitioners and women undergoing abortion from criminal liability.[31] In the United States, abortion is available on request as a matter of a woman's constitutional right to privacy,[32] but delivery and financing of services can be variously controlled by state laws.[33] In Canada, abortion (particularly in the early stage of pregnancy) is available as a matter of a woman's constitutional rights of liberty and security of the person;[34] health services, including abortion,

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are provided through provincial health insurance plans, with the federal government setting minimum standards of comprehensiveness and accessibility.[35] In all countries that legislatively or constitutionally permit abortion, approval of abortifacient drugs is a matter of administrative law and is not distinguishable in principle or approach from approval of therapeutic drugs. For regulatory approval in any country, all drugs are required to meet reasonable standards of safety and efficacy in intended use.[36]

This commentary explains the legal and regulatory status of RU 486 as used in combination with prostaglandin in France and addresses some of the legal questions that countries, including the United States, will have to face as they consider approval of this and other antiprogestin drugs for abortifacient purposes.

RU 486 in France

On January 17, 1975, France liberalized its abortion law for a five-year provisional period to allow abortion in cases of "distress" of the woman during the first trimester of pregnancy; after the first trimester, abortion was allowed only in cases of risk to the physical health or life of the woman or risk of fetal handicap.[37] This 1975 law was reenacted on December 31, 1979, on a permanent basis with minor revisions.[38] In practice, the French law accommodates abortion on request during the first trimester since the woman herself decides whether she satisfies the "distress" indication.[39] The French law does require that a woman wait a week between the time that she first requests the procedure and the time that it is performed, so that she can reflect on her decision.

On September 23, 1988, the French Minister of Solidarity, Health and Social Welfare announced that RU 486 with prostaglandin had satisfied the legal requirements for toxicity testing for short-term episodic use as required for other therapeutic drugs.[40] Based on favorable recommendations of its expert scientific commission, the Ministry granted its approval for marketing and distribution of RU 486 with prostaglandin for abortifacient indications, under strict protective conditions similar to those for the distribution of narcotics.[41] The regulations require that each package of the drug be assigned a specific number to track its distribution and use; that distribution be limited to public and private hospitals and clinics that are authorized to perform abortions; and that the amount of the drug and the name of the physician or of the person in charge of the center authorized to prescribe it be recorded in a special register.[42]

On October 25, 1988, Roussel-UCLAF announced suspension of distribution in France and elsewhere due to "French and foreign public opinion and the controversy raised by the possibility of using the antihormone mifepristone (RU 486) to voluntarily interrupt pregnancy."[43] Two days later, there was an international outcry over the suspension of distribution,[44] including a petition signed by more than 1,000 doctors who were attending a meeting in Rio de Janeiro. Their statement read as follows: "We the undersigned, participants in the XIIth World Congress of Gynecology and Obstetrics, regret the decision of Roussel-UCLAF to suspend the distribution of RU 486 (mifepristone), particularly in view of the recent approval of RU 486 as safe and effective by the drug regulatory authorities of the governments of China and France. It has been used for early termination of pregnancy and has the potential for a number of therapeutic purposes, including the treatment of cancer. We urge the company to transfer the patent to an appropriate entity to ensure that women have access to the benefits of scientific progress."[45]

On October 28, 1988, the French Minister of Solidarity, Health and Social Welfare ordered Roussel-UCLAF to resume distribution, claiming that it was important for public health and that the drug was "the moral property of women." He also threatened to invoke provisions of the French patent law permitting the Minister of Health to transfer a drug patent to another holder if the original holder fails to distribute the drug.[46] As of September 22, 1989, however, the Minister of Health had not yet specified the reimbursement rate for RU 486 abortions. (The French National Health Service does reimburse 75 percent of the cost of surgical abortions.[47])

The possibility of alternative avenues of distribution had, in fact, been created earlier in agreements between Roussel-UCLAF and some organizations that had done research on the drug to protect public funds invested in the research and to enable the distribution of RU 486 in the Third World should Roussel-UCLAF decline or fail to do so. Before the September 1988 approval of the drug in France, the company had successfully obtained approval for the distribution of RU 486 in the People's Republic of China,[48] but currently Roussel-UCLAF is not providing drugs for distribution outside France.

In France, a woman wishing to use RU 486 with a prostaglandin for an abortion must make four visits to a clinic or a hospital authorized to perform abortions, according to the 1979 abortion law and the approved distribution protocol. Her request for an abortion is made at the first visit, and she will be eligible for treatment with RU 486 in combination with a prostaglandin if it has not been more than 42 days since her last menstrual period. If more than 42 days have passed since the first day of her last menstrual period or more than 14 days have passed since her missed period (in a 28-day menstrual cycle), she is ineligible for an abortion using RU 486 with prostaglandin.

At the second visit, a minimum of one week later, the woman confirms her request for an abortion. If she decides to proceed after having considered information describing the advantages and disadvantages of the method, she gives her written consent and takes three tablets of RU 486 orally in the presence of the doctor. She then goes home, with a number to call in case of emergency, and with an appointment to return to the clinic or hospital 36–48 hours later.

At the third visit, the prostaglandin is administered, either by injection or by vaginal suppository. The woman rests for 2–3 hours and then goes home with a prescription for oral contraceptives and an appointment to return about one week later. Vaginal bleeding lasts for about seven days. At the fourth visit (15–19 days after the first visit), the completeness of the abortion is verified. If, as in five percent of cases, the abortion is incomplete, the woman will be advised to undergo a vacuum aspiration procedure.

During her second visit, before consenting to the procedure, each woman receives an information sheet that outlines the necessity for the four visits. The sheet explains how the drug is believed to work and that it causes the interruption of pregnancy in 95 percent of cases when prostaglandin is administered 36–48 hours after RU 486. The information sheet also notes that the treatment is contraindicated when the pregnancy is not confirmed, when ectopic pregnancy is suspected or when the pregnancy is advanced beyond 50 days since the last menstrual period (or 21 days since the missed period) for women with 28-day cycles. It also explains that treatment is contraindicated for women with Cushing's syndrome, for women using cortisone and for women with health conditions, such as asthma or severe hypertension, that would prevent them from safely using a prostaglandin.

Each woman is informed that if the abortion with RU 486 and prostaglandin is incomplete, her health will be endangered if she does not have a vacuum aspiration procedure. Moreover, a vacuum aspiration abortion will be recommended if the treatment does not work at all; if the pregnancy is taken to term, there may be a risk of fetal malformations. Finally, the information sheet lists possible side effects of the treatment: heavy bleeding lasting about seven days, pelvic pain, nausea and vomiting, diarrhea, malaise, fatigue and headaches.

Drug Approval Procedures

In seeking approval for marketing its product from the relevant governmental drug authority, such as the U.S. Food and Drug Administration (FDA), the sponsor must specify the conditions that the drug is being promoted to treat. After receiving an application for approval for marketing a new drug for specific conditions, a drug authority responds in accordance both with the legislated review process and with background interpretations that the courts have developed to ensure conformity to general principles of fairness.

The review process gives the governmental drug authority discretion to require scientific data from testing of the product on animal and human populations, and perhaps from in vitro studies. The courts will control exercise of the discretion in order to ensure that the discretion is used on scientific grounds and for legitimate public policy purposes, and not for purposes or agendas unrelated to the law and the merits of the sponsor's application.

The governmental drug authority must consider the safety and efficacy of the product for the purposes for which approval is sought, and therefore has no power to make a decision based upon extraneous factors. In legal language, basing a determination on extraneous factors would be outside its powers, or *ultra vires*, and therefore unlawful. An *ultra vires* decision may be judicially struck down, which would require the agency to review the application in accordance only with proper criteria.

The legal mandate to resist ideological pressure is particularly significant when an application for approval of an abortifacient drug is being reviewed. Roussel-UCLAF's development of RU 486 and the French government's subsequent review have been subjected to pressure from antiabortion groups.[49] French embassies in the United States and elsewhere were also subjected to demands that the drug not be approved.[50] Opponents described the drug as "an antihuman pesticide to be used in chemical warfare against women and children"[51] and as a "death drug ... intended to kill unborn babies."[52] Right-to-life groups have focused their hostility on this drug not only because it threatens to make abortion potentially more private, but also, they allege, because it leaves women uncertain about whether or not they have actually experienced abortion.[53]

The threat that ideological considerations may affect and obstruct fair and scientific assessment of antiprogestins such as RU 486 is a matter of concern.[54] Responses of drug administrative agencies to applications for approval of antiprogestins will come under unusually intense and critical scrutiny. Because of this, some drug administrators may either delay their decisions indefinitely or demand evidence of safety and efficacy well beyond that required for comparable products.

In the case of RU 486, the French government applied normal standards of approval used for other comparable drugs. In other countries, however, approval of antiprogestin drugs for abortifacient purposes could be delayed or denied if administrative agencies use standards that are not relevant to the drugs' safety and efficacy. Sponsors whose applications for approval are rejected because of irrelevant criteria may seek to strike down the rejection as being *ultra vires*, and seek a judicial order that their application be determined only according to relevant criteria.

A pervasive problem in the administrative process is that of the appearance or reality of bias on the part of administrative bodies. There is a preference in the product approval field for being conservative in the scientific sense; that is, there is a tendency to be unwilling to approve innovation except after rigorous demonstration of both safety and efficacy. In most cases, the FDA would face stronger criticism for prematurely approving a drug that is subsequently shown or suspected to cause injury disproportionate to its benefit than for delaying approval of a beneficial product until exacting standards of safety have been satisfied. A recent illustration in the other direction, however, is the public outcry and subsequent relaxation of standards by the FDA to increase the availability of drugs that may reduce the effects of the human immunodeficiency virus.[55]

In the case of RU 486, the FDA may proceed to review such an application based on scientific merit, according to its own enabling legislation, regardless of political pressure. However, political bias against antiprogestins is anticipated because of the self-professed antiabortion ideology of the Bush Administration and certain members of the U.S. Congress, where a bill was reintroduced in 1989 that would prohibit "[f]ederal financial assistance in any form ... to investigate the antiprogesterone steroid for ... approval under the Federal Food Drug and Cosmetic Act."[56] Commentators have speculated that approval of an application for RU 486 in the United States during the Bush Administration would be unlikely, not because of the scientific merits of the application but because of opposition from the administration and certain members of Congress to a drug that provides a nonsurgical means of abortion.[57] Because of political pressure, there is a possibility that the FDA may mask a political decision with a professed scientific assessment, or may delay its evaluation of the drug.

There is evidence that the FDA has already singled out RU 486 for exclusion from a policy that permits individuals in the United States to import unapproved products, under certain conditions, from foreign sources. On July 20, 1988, the FDA's director of the Office of Regional Operations circulated a field directive, released to individual importers, concerning the importation of products that individuals purchase from foreign sources for their personal use. This directive observes that "we may use our discretion to examine the background, risk, and purpose of these products before making a final decision."[58] To provide for a uniform policy, the director stated that shipments may be released to an individual under various conditions: "... the patient seeking to import the product affirms in writing that it is for the patient's own use and provides the name and address of the doctor licensed in the United States responsible for his or her treatment with the product."[59]

Then, in a bulletin of September 26, 1988, the importation of RU 486 was specifically excluded from this policy.[60] A subsequent import alert of June 6, 1989, from the director of the Division of Field Investigations on "Automatic Detention of Abortifacient Drugs" reads as follows: "Questions have been raised about a new abortifacient product, RU 486 or 'mifepristone,' and whether the agency should use its discretion, ... to allow its importation for personal use. [The] FDA has concluded that unapproved products of this kind would be inappropriate for release under the personal importation policy. The intended use of such drugs could pose a risk to the safety of the user." This safety caution is questionable since there is no evidence that RU 486, used under a doctor's supervision, is more risky than currently available abortion methods. A legitimate concern for safety would allow for the importation of the prostaglandin used in France (but not currently distributed in the United States) when the FDA allows personal importation of RU 486. As noted above, RU 486 is at least 10 percent more effective when used with prostaglandins.

Legislative Models

A danger exists that ideology may supersede science in policymaking on the release of certain drugs in the United States and other countries. If the potential of fundamentalist religious and extremist beliefs to limit reproductive choice is to be resisted, initiatives must be taken to urge legislation at the federal and state levels that will protect freedom of choice and permit individuals access to safe and effective means of achieving their reproductive goals. Regarding antiprogestin drugs, several legislative models might be considered and refined according to particular circumstances.

- *The reproductive health model.* This model encourages the provision of a range of reproductive health services that would accommodate but aim to minimize the need for induced abortion, particularly late in pregnancy. Federal or state legislation would provide financial and other incentives to public and private organizations to provide a range of reproductive health services including prenatal care, treatment for sexually transmitted diseases (STDs), infertility treatment and counseling, provision of contraceptives, voluntary sterilization and, finally, abortion—to be made accessible as early as possible in pregnancy. Legislative proposals might include special programs to educate adolescent and adult males in the prevention of STDs and pregnancy. They might also require that abortion services be made available so as to enable access at the earliest possible stage of pregnancy. Moreover, those providing abortion might be required to use the method that is the safest and least traumatic for the woman and that contraceptive services be provided in the postabortion phase.

The right-to-life movement is divided on contraception, and might be somewhat circumspect in mounting comprehensive opposition to such a proposal.[61] Those in the movement who do favor contraception generally take a narrow view of contraceptive practice, and consider some methods of fertility control (such as the IUD and certain oral contraceptives), to be abortifacients.[62] Because the influence of Roman Catholic doctrine is pervasive in the antiabortion movement, its members may also object to voluntary sterilization; however, less doctrinaire opponents of abortion might consider this to be a desirable option in some circumstances.

Elements of the reproductive health model are found in many of the Western European laws. The Italian law on the Social Protection of Motherhood and the Voluntary Termination of Pregnancy emphasizes the promotion of women's reproductive health and the related prevention of unwanted pregnancy by facilitating access to contraceptive methods and voluntary sterilization.[63] It also requires "the use of modern techniques of pregnancy termination, which are physically and mentally less damaging to the woman. . . ,"[64] This and other similar provisions may eventually require that nonsurgical abortions be provided, using antiprogestin drugs with prostaglandin.

- *The defensible service model.* One feature of induced abortion in the United States is its relatively high incidence among women who lack access to sex education, contraceptive advice and methods, and other reproductive health services.[65] For historic reasons reinforced by modern jurisprudence,[66] the federal government and state legislatures have resisted funding many health services, including preventive care. Considering this reluctance, advocates for such services might choose instead to prepare a defense for possible criminal charges in cases of late abortion. The defense could be that the woman did not have reasonable access to contraceptive counseling and methods or access to an early abortion. The thrust of the legal challenge would be to encourage the provision of contraceptive and early abortion services and put forward the principle that where contraceptive and early abortion services are unavailable to women, restrictive laws regarding abortion should not be invoked against women or against those who intend to advise them regarding their reproductive choices.

- *The fault-based liability model.* In product liability law, courts have found manufacturers liable for the harmful effects of certain products unless the manufacturer can show that it was not at fault. This development was inspired by the need to improve consumers' rights against manufacturers who enjoy the power of vast resources and exclusive knowledge of their own manufacturing practices. Under this system of liability, in which the plaintiff does not have to prove fault on the part of the manufacturer (sometimes called the strict-liability system), users of a product need only show injury consequent on use to be entitled to recover compensation. The superior resources and knowledge of the manufacturer are available to the defense to disprove negligence and show due diligence in the design, manufacture, storage, packaging, transportation and delivery of the product and in the education of those who will be prescribing or dispensing it.

In addition, the law requires that products be suitable for the purpose for which they are intended and not be unreasonably dangerous. A product that causes injury in anticipated use will make the manufacturer liable unless the manufacturer can show no fault in the design, selection of materials, or, for instance, manufacture and marketing of the product. The law recognizes that some products may be unavoidably dangerous because of their known properties or qualities. For instance, drugs tend to fall into this category when there is a significant risk of side effects and of idiosyncratic physiological responses. Manufacturers must be able to show, however, that their product is not unreasonably dangerous; they cannot simply rely on their conformity to governmental standards or having satisfied FDA standards for approval and marketing.

Under a strict product liability law, pharmaceutical manufacturers may face considerable costs in defending suits for injuries arising from use of their products. Further, because juries are generally sympathetic toward plaintiffs' medical expenses, pain and suffering and lost opportunities in life, damage awards can be very high. Drug companies have therefore become reluctant to develop products that may attract financially burdensome legal claims.[67] The manufacturer of an antiprogestin abortifacient drug may be deterred from marketing the product because of the potential for lawsuits by women claiming to have lost reproductive and other opportunities in life. Other lawsuits may result from women or their offspring blaming the drug for various birth defects. Antiabortion groups may attract such individuals and support claims of this nature.

Because potential liabilities may limit the development of new products, proposals are currently under consideration to change product liability law to encourage innovation in the development of new products by pharmaceutical and biotechnological means.[68] These proposals include legislation that would replace the consumer-oriented system of liability with the more traditional principle that a plaintiff claiming injury through negligence or other fault must bear the burden of establishing the facts on which the claim is based. The result of such legislation would be that manufacturers would remain liable for faults that complainants can show in the design, manufacture and marketing of products, but would be relieved of strict liability under which they must disprove wrongdoing. The antiabortion movement is monitoring the development of such legislation and pressing for the exemption of contraceptive and abortifacient products from any protection manufacturers may gain.[69]

- *No-fault insurance model.* The disadvantage of the fault-based liability model is experienced by the consumer who claims to have been injured through use of a product and must prove a case when evidence is difficult and expensive to obtain. An alternative model that aims at a fair balancing of interests between injured consumers and manufacturers of products retains the consumer-oriented no-fault liability system, but grafts onto it creation of a fund from which compensation is payable. The underlying principle of the insurance system—the spreading of risk among potential sufferers—would be the basis of this model. A premium would need to be added to the price of the product to create a sufficiently large fund to compensate users for injuries that would be considered necessary and appropriate to cover.

An example from a related field in the United States is the National Childhood Vaccine Injury Act of 1986. The Act provides for the collection of revenue from a special tax added to the cost of the seven pediatric vaccines that children must receive to attend school. The fund created by the tax revenue protects vaccine manufacturers, who had threatened to withhold their products because of the incidence of liability litigation and the burden of legal defense. The beneficiaries of the product are accordingly obliged to participate in collective self-insurance by paying a premium in exchange for financial protection against risk of injury. A model of this nature could be developed to give manufacturers of antiprogestin and prostaglandin products the financial confidence to proceed to marketing. It is a matter of economics and of market organization whether consumer self-insurance should be confined to abortifacient products or be absorbed within the more generalized scope of reproductive-related products, including contraceptives.

- *The patent protection or promotion model.* As an alternative or an addition to the above models, patent law may be changed to encourage manufacturers to develop new products and to seek to market products that original developers fail to market. The former goal can be achieved by simply prolonging the period of patent protection, so that manufacturers of antiprogestins and prostaglandins may recoup their costs of research and development and accumulate profits. From these profits, a fund could be established for the compensation of injured users, either on a fault-based or strict-liability system. The present period of patent protection in the United States is currently 17 years, but the Patent Term Restoration Act of 1984 affords extensions of 2–5 years for patents of drugs, under certain conditions.[70]

When patents have been granted to manufacturers who subsequently decline or fail to market a product, governmental authorities in several countries, such as France[71] and Canada,[72] have the legal power to transfer the patent to a new holder who undertakes the marketing of the product. Exercise of the power is clearly dependent on an applicant applying for the patent, but the potential for transfer acknowledges that a drug patent serves not only the commercial interests of the holder but also the health interests of potential users. This is the sense in which mifepristone was described by the French Health Minister, Claude Evin, as the "moral property" of women.

No one of these models alone may be sufficient to encourage potential marketers of antiprogestin and prostaglandin drugs to apply for their approval for abortifacient indications. These and other similar kinds of legislative models may indicate the type of strategic planning that will have to be done to make antiprogestin and prostaglandin abortifacient products accessible. Commercial manufacturers might be faced with the threat of a boycott of the entire range of their products by antiabortion activists and by purchasing officers of certain hospital and institutional pharmacies.[73] It may therefore be necessary for nonprofit organizations or specially created single-product firms to develop or import products for national distribution.

Conclusion

The challenge to produce safer and more effective contraceptives continues to inspire scientific study and research. In the absence of a completely safe, effective and convenient method of contraception, contraceptive failure will continue, as will the need for a humane and prompt response to its occurrence. Similarly, methods of abortion are sought that can be used as early as possible in pregnancy and that are effective, safe and convenient. Antiprogestin abortifacients when used in combination with prostaglandin represent a significant advance toward this goal. They also represent for women, and the children and families that depend on them, the realization of the right established in the International Covenant on Economic, Social and Cultural Rights "to enjoy the benefits of scientific progress and its applications."[74]

The servicing of this right and of related rights of access to health care involves the responsibility of, among others, national drug regulatory authorities. Their responsibilities are discharged through fair assessments of relevant scientific evidence and the application of policies designed to maximize the safety and efficacy of therapeutic products. In making risk-to-benefit assessments, they must also be aware of the alternatives potential users of products will have if certain new products are denied approval for marketing. These decisions must be based on scientific assessments and should not be swayed by moralistic judgments or ideologies. Scientific policy cannot be guided by ideologies on the sanctity of human life that disregard the autonomy of women and that ignore objectively derived data on the risks and the benefits of antiprogestin drugs. Moreover, the advances that such a product can make in the quality of the lives of women and of those who rely on their survival, health and well-being cannot be ignored.[75] In this regard, the characterization of RU 486 as the "moral property of women" begins to provide a much needed basis for women's entitlements to high quality reproductive health services.

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Special Report

Reconsidering the Age Limits on Pill Use

By Lisa Kaeser

An advisory committee to the Food and Drug Administration (FDA) has recommended the removal of all age limits on the use of oral contraceptives by healthy, nonsmoking women.[1] Although the FDA currently has no fixed position on the upper age limit for use of oral contraceptives, most clinicians, including family planning providers, have adhered to a limit of 35 years for women who smoke and 40 for those who do not. This practice has grown out of warnings contained in the FDA-approved patient package insert for oral contraceptives, which was most recently revised in 1988: The section on "Estimates of Mortality from Contraceptive Use" indicates that ". . . smokers 35 and older and non-smokers 40 and older who use oral contraceptives have an increase in mortality higher than those using other methods of birth control."

The Fertility and Maternal Health Drugs Advisory Committee made their decision at an October meeting called in response to criticism by increasing numbers of gynecologists of the current labeling. Many physicians believe that the availability of low-dose pills has reduced the relative risks among older women, and more and more gynecologists have continued to prescribe the pill to women over age 35 on an individual basis. This practice was formalized in a 1988 statement issued by the American College of Obstetricians and Gynecologists, asserting in part that "healthy, nonsmoking women 35–44 may continue to use oral contraceptives."

Evidence Presented

The process by which the committee's decision was reached differed somewhat from the norm. As Barbara S. Hulka, committee chair and professor and chair of the Department of Epidemiology at the University of North Carolina School of Public Health, pointed out, "This recommendation is based on very little new data. . . . It's primarily based on informed opinion."

One reason for resorting to informed opinion is the relatively scanty evidence regarding the effects of oral contraceptive use on women older than 40. Several studies published in the mid-1970s showed an increased cardiovascular risk for women in this age-group (particularly smokers);[2] as the results from these studies were publicized, the number of older women using oral contraceptives declined rapidly, Daniel R. Mishell, Jr., professor and chair of the Department of Obstetrics and Gynecology at the University of Southern California School of Medicine, told the committee. Cautionary restrictions regarding pill use were incorporated into physician information and package labeling, which advised against oral contraceptive use by all women over the age of 40 who do not smoke and all women over 35 years who do. Accordingly, few women in these categories have used the pill since that time.

The single greatest factor influencing the committee's decision appeared to be the need for—yet lack of—contraceptive options for women in the latter part of their reproductive years. Because no national survey documenting contraceptive use has included women over the age of 45, Judith A. Fortney, director of the Division of Reproductive Epidemiology of Family Health International, provided the committee with estimates regarding the number of women 35–49 who might be able to conceive: 86 percent of 10.1 million women aged 35–39; 78 percent of 8.9 million women 40–44 and 69 percent of 7.1 million women 45–49.[3] Thus, Fortney estimated, there are more than 10 million women older than 40 in the United States who still need fertility control methods.

Furthermore, fecund women in these age-groups are far less likely than younger women to want to become pregnant. Among the reasons are the health hazards of pregnancy and childbirth, including an increased risk of maternal mortality; maternal mortality is 10 times higher among women aged 40–44 than among women in their 20s and 50 times higher among women aged 45–49, according to Fortney. She pointed out that the risk of birth defects, toxemia and other hazards attendant upon childbearing also increase. Fortney noted that the abortion rate for women older than 40 remains one of the highest of any age-group—40 percent overall.

Despite a declining desire to become pregnant among women older than 35, the range of contraceptive options available to these women is even more limited than for all women who are trying to prevent unintended pregnancy. Most commonly, women in this category choose sterilization as their method of birth control.[4] While these women are less likely than their younger counterparts to regret their decision, some may be choosing sterilization for lack of other safe, highly effective methods.

Of the reversible contraceptive methods currently available to women over 40, the committee was informed by Fortney that condoms are the most popular. Condoms represent no risk to health, their cost is minimal and they provide protection from sexually transmitted diseases; yet their failure rate, even for those women with decreasing fecundity, may be of concern to users. The IUD is the next most prevalent method, although its use dropped during the 1980s, when several types were withdrawn from the market because of liability concerns. However, the advent of a new, highly effective copper IUD, the ParaGard, may renew interest in this method among older women. Because of the onset of menstrual irregularities, women over 40 are unlikely to begin using natural family

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planning, although those who have been successfully using it may continue to depend upon it. The least commonly used method among this age-group (other than the pill) is the diaphragm, primarily because of the possibility of reduced effectiveness arising from cervical changes.

Removing the age restrictions on the use of oral contraceptives would provide women older than 40 with another contraceptive method, and a very effective one, from which to choose. The committee also realized, however, that the likelihood that many women would first begin using the pill after age 40 is slight. Consequently, in reviewing the limited amount of information available regarding potential risks, it focused on the possibility that women still using oral contraceptives after age 40 could have been exposed to them for as much as 20 years. Thus, the effects of long-term use of low-dose pills became the committee's paramount concern.

To address this concern, the committee reviewed research on the association between pill use and cardiovascular disease. It agreed that the evidence remains incontrovertible that smokers, especially those older than 40, should not take the pill. Studies performed in the 1970s had suggested a possible increased risk of cardiovascular disease for nonsmokers older than 40 as well. More recent data that would be applicable to the lower estrogen content of present oral contraceptive formulations does not exist, partially because low-dose pills have only been in widespread use for approximately 10 years.

As for whether there is an increase in the incidence of breast cancer among women who have taken the pill, the committee regarded the evidence as inconclusive. Most studies over the past 20 years have shown no overall increase in the incidence of breast cancer;[5] nonetheless, some recent analyses have pointed to possible increases among certain subgroups, particularly women who began to use oral contraceptives at an early age and whose use extended over a long period of time.[6] Research continues in these areas, as scientists try to reconcile the various findings.

Several committee members also reiterated findings of the protective effects of the pill—in addition to that of pregnancy prevention. They cited evidence of a decreased risk of developing ovarian and endometrial cancers with pill use.[7] It was also noted that some studies have found an increase in the risk of cervical cancer.[8] The committee acknowledged the need for further documentation regarding other risks and benefits of oral contraceptive use, particularly among older women, in whom the incidences of heart disease, breast cancer and other disorders naturally rise with age, making it more difficult to determine if there is any link between these diseases and oral contraceptive use.

Committee Decision

After considering the material presented, the committee moved quickly to remove the age limitation on the use of oral contraceptives, with exceptions for women older than 35 who smoke and for women who have medical contraindications, such as hypertension, diabetes and cardiovascular diseases. The vote to remove the age limit was six to zero, with two abstentions. Although committee recommendations are advisory, FDA officials generally give them great credence.

Committee members were unanimous in calling for more research on the issues surrounding pill use by older women. In this instance, medical practice in the field preceded regulation, and panel members stated that, although no clear data were presented demonstrating extra risk for this age-group, nonetheless the decision was a judgment call. Hulka, in summing up for the committee, concluded that overall, the relative risks of pregnancy, childbirth, maternal mortality and morbidity, and alternative surgical procedures such as sterilization and abortion were believed to outweigh the less defined risks of cardiovascular disease and cancer among healthy, nonsmoking women older than 40.

The FDA committee's decision may represent a new era of frustration on the part of researchers and providers alike. The process utilized in reaching the decision to remove age limitations was clearly a departure from past procedures, in which decisions were based on the weight of research evidence. Yet, just as obviously, the majority of committee members felt driven by the need for more contraceptive options for women older than 40. Nonetheless, these same health professionals and agency officials may not be completely comfortable with their decision until far more is known about the need for birth control methods and their use by older reproductive-age women.

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Research Note

Contraception: Short-Term vs. Long-Term Failure Rates

By John A. Ross

New estimates of contraceptive failure rates in the United States published recently by Elise Jones and Jacqueline Forrest[1] lead naturally to the question of their long-term implications. It is not generally understood, least of all among most contraceptive users, that small risks taken repeatedly accumulate to very large risks over a long period.

Many couples complete their childbearing early and then face 10–20 years of contraceptive need. Other couples who postpone all childbearing until their 30s need long-term protection before their first birth. For both groups, contraceptive choices should be informed by an appreciation of differences in risk among methods.

For a young couple of undiminished fecundity who are not practicing contraception, the monthly risk of pregnancy is about 15–20 percent.[2] A contraceptive that is 95 percent effective reduces this risk to around one percent. That one percent risk, taken monthly over 10 years, accumulates to a 70 percent probability that an unwanted pregnancy will occur during that period.* Some conceptions end in miscarriages, but an allowance for the approximately one-fifth of conceptions that terminate spontaneously still produces a 62 percent chance of a viable pregnancy. The couple involved then face the choice between an induced abortion and an unplanned birth.

Older couples have their own difficulties, since much childbearing now ceases very early. In 1982, half of women aged 30–44 who had ever been married had had their last wanted birth by age 27, and three-fourths had done so by age 30. Among women who had married before their 20th birthday, half had finished their wanted childbearing before age 25.[3] If reproductive capacity is considered to end at about age 45, that leaves an average of 20 years in which contraceptive protection is needed.

Because abortions are underreported in surveys, Jones and Forrest adjusted their contraceptive failure rates to correct for the omission of unreported failures that end in induced abortions. Their rates are "first-year rates"—that is, they represent the first year of any segment of use whether or not it is a woman's first experience with that method. Most of the rates are comparable to those reported by William Grady and colleagues,[4] which are first-year rates in the same sense as those of Jones and Forrest and are also adjusted to account for abortion-related failures. The exception to their comparability is the failure rate for the pill, which Grady and colleagues report as 2.3 and Jones and Forrest give as 6.2.

Satisfactory sets of long-term failure rates are hard to find; for example, the National Surveys of Family Growth (NSFG) use no more than a three-year recall period for contraceptive failure. James Trussell and Jane Menken published first-year and second-year rates from the initial NSFG based on experience in 1970–1973;[5] these showed a considerable drop in the risk of pregnancy during the second year of contraceptive use. On the other hand, Irving Sivin and Frederick Schmidt found that women in 17 of 25 clinical trials of the copper IUD experienced higher second-year than first-year pregnancy rates (possibly related to lactation and less frequent coitus among women in the first year postpartum).[6] Over the long run, however, it must be assumed that the annual rates decline.

Individual vs. Group Risks

Failure rates for individuals must be viewed differently from those for groups. As Robert Hatcher and colleagues stress, ". . . while the probabilities of conception may remain roughly constant over time for an individual couple (assuming that behavior does not change), they will decline for a group because the most fecund will become pregnant first. As time passes, those who have not conceived constitute a less and less fecund group."[7]

Group rates decline with time largely because of heterogeneity: Couples differ in their biological fecundity, in their coital frequency and in the care with which they practice contraception. Those most prone to conception drop out early, leaving a residual group at lesser risk; this process is especially intense in the early years. If all couples were of precisely equal risk, the annual rates would decline less, although some decline would occur simply because of aging.

The primary focus of this article is the individual, whose risk may not diminish with time or may decline much less than that for a group.† Strategies for individuals must be devised under different assumptions from those that underlie group projections. Couples starting on a contraceptive regimen clearly believe themselves

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*The 10-year risk of one or more failures over the years is the probability of surviving one month without pregnancy taken to the 120th power (120 months), and then subtracted from 1.0. Thus, a one percent probability of failure is a 99 percent probability of success. Taking 0.99 to the 120th power gives 0.299 as the probability of going 10 years without a pregnancy, or a 70 percent chance of one (or more) failures.

†Group failure rates are expected to decline sharply for cohorts starting contraceptive use soon after the return of menses, because the most fecund women conceive quickly. However, rates obtained from use soon after the return of menses are not the rates used in this article. The rates used here were obtained from retrospective interviews and refer to past contraceptive use occurring at various periods following the last birth. The data are based upon the first year of the most recent experience with the method in question. Such rates may already be depressed by some of the same selectivity that eliminates high-risk persons from any group followed over multiple episodes or years of use.

Table 1. One-year contraceptive failure rates per 100 users and three projections for 10-year failure rates, by method

Method	One year	10 years		
		1*	2†	3‡
Pill	6.2	47	38	27
Condom	14.2	78	68	52
Diaphragm	15.6	82	71	56
Rhythm	16.2	83	73	57
Spermicide	26.3	95	89	76
Other§	22.2	92	84	69
IUD	6.0	46	37	26
Female ster.	0.4	4	3	2
Vasectomy	0.15	1	1	1

*Constant risk over 10 years at the one-year rate.

†One-year risk falls linearly by half over 10 years.

‡One-year risk falls linearly to zero over 10 years.

§Mainly withdrawal and douche.

to be fecund and at risk of an unwanted pregnancy for an indefinite period, and they are best advised to consider the manner in which steady monthly risks can accumulate. This cumulative risk has important implications for counseling practices and clinic procedures.

To suggest how the accumulation occurs and also to recognize some diminution in the annual risk, this article will illustrate contraceptive failure rates over time under three hypotheses: The first assumes that the annual risk for each method will remain constant throughout a 10-year period, a second set assumes that the annual risk for each method declines by half over 10 years and a third set assumes that failure rates for the various methods decline to zero over the 10 years. Each of these assumptions is more conservative than the previous one, and they allow for a number of possibilities. As the calculations will show, the pregnancy rate is so high under the first assumption that even if some subgroups have greater annual risks than those used here, the outcome could not be much more drastic. It happens that the calculations for the assumption under which the annual risk declines by half are nearly identical to a three-fourths risk kept constant; those under the assumption in which the annual risk declines to zero also represent a one-half risk kept constant.

Table 1 lists the first-year failure rates as calculated by Jones and Forrest for the pill, the condom, the diaphragm, rhythm, spermicides and "other" methods. The IUD and sterilization rates listed are those given by James Trussell and Kathryn Kost as the typical actual-use risks for these methods among U.S. women.[8] Ten-year failure rates using each of the three assumptions are also shown.*

An annual failure rate of 6.2 percent among pill users means that as many as one-half of them may become pregnant over a 10-year period.† The figures are higher yet for the other resupply or coitus-dependent methods: Under the most conservative assumption, the proportion of users who will experience one (or more) failures sometime between initiation of use and the 10-year point ranges from 52 percent of condom users to 76 percent of spermicide users. Under the least conservative hypothesis, failure rates would range from 78 percent to 95 percent of these same groups.

Typical first-year failure rates of six percent, 0.4 percent and 0.15 percent for the IUD, female sterilization and vasectomy, respectively, work out to 10-year risks as high as 46 percent for the IUD,‡ four percent for female sterilization and one percent for vasectomy. Thus, sterilization is by far the most reliable method over the long run, particularly vasectomy. Nevertheless, among those who rely on female sterilization, the highest failure rate of four percent translates to one woman in 25 who may become pregnant over 10 years. This risk applied to the millions of women relying on sterilization is not a negligible number.

Risks of Nonuse

The highest pregnancy risks of all occur during nonuse of contraceptives: Some 80–90 percent of fecund couples will become pregnant during the first year of exposure alone.[9] This rate has been demonstrated in numerous studies of couples who stop using contraceptives to become pregnant and by the proportion of women who conceive within one year of marriage in societies where premarital sex is rare and all couples want the first child as soon as possible. In surveys of the general population, the figure is lower—about 40 percent conceiving in one year among unprotected couples who want no more children.[10] This lower rate is understandable, since any general group omits those already pregnant and includes some couples who have low fecundity and who engage in coitus infrequently. Such a group contains many members well past the first year of exposure since the postpartum return of menses (when failure rates are highest), and is somewhat selected for lower risk.

Nonetheless, an annual rate of 40 percent is still high. Couples who do not practice contraception and who wish to cease childbearing after two births would require large numbers of induced abortions if they were to achieve their family-size desires. Calculations that adjust for such factors as reduced fecundity with aging, heterogeneous fecundability, periods of noncohabitation, onset of permanent sterility and spontaneous abortion indicate that 12 additional pregnancies would occur before a woman reached menopause.[11]

Patterns of Long-Term Risk

Figure 1 shows the relationship among the three assumptions regarding 10-year contraceptive failure rates. As the annual failure rate increases along the bottom axis, the 10-year failure rate rises rapidly. Under the most conservative assumption (lowest curve), one in four users of a contraceptive method with an annual risk of only six percent will have experienced a pregnancy by the end of 10 years, and half will have done so if the annual risk is about 13 percent. Under the least conservative projection, the 10-year failure rate reaches a level of one-fourth of users at an annual risk of only three percent and one-half at an annual risk of about seven percent. The primary message of the figure is simply that all three lines rise quickly to very serious levels of long-term failure.

Reductions in the annual risk pay off with increasingly larger gains. All three curves descend very sharply to the left, as the annual risk approaches zero. Under the constant-risk assumption, the 10-year rate falls only nine percentage points when the annual risk decreases from 0.20 to 0.15, but it falls a full 25 points when the annual risk decreases from 0.10 to 0.05. The implications are extremely important: Contraceptive users who change from one unreliable method to another may do little to change the likelihood of pregnancy, but those who change to a very reliable method reduce their long-term risk very substantially.

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*These rates are derived in the same way as explained in the first footnote on page 275. Monthly rates must first be calculated, however. For the condom, for example, the annual chance of survival as calculated from Table 1, is 0.858 (1–0.142); the twelfth root of this is 0.9873 for the monthly rate; the monthly rate taken to the 120th power is 0.22, and 1.0 minus 0.22 is 0.78.

†If one wishes to remove spontaneous miscarriages from the pregnancy events, leaving only the candidates for abortion or childbirth, the monthly risk is multiplied by 0.8. The result is little changed; for example, the 47 percent for the pill in Table 1 becomes 40 percent.

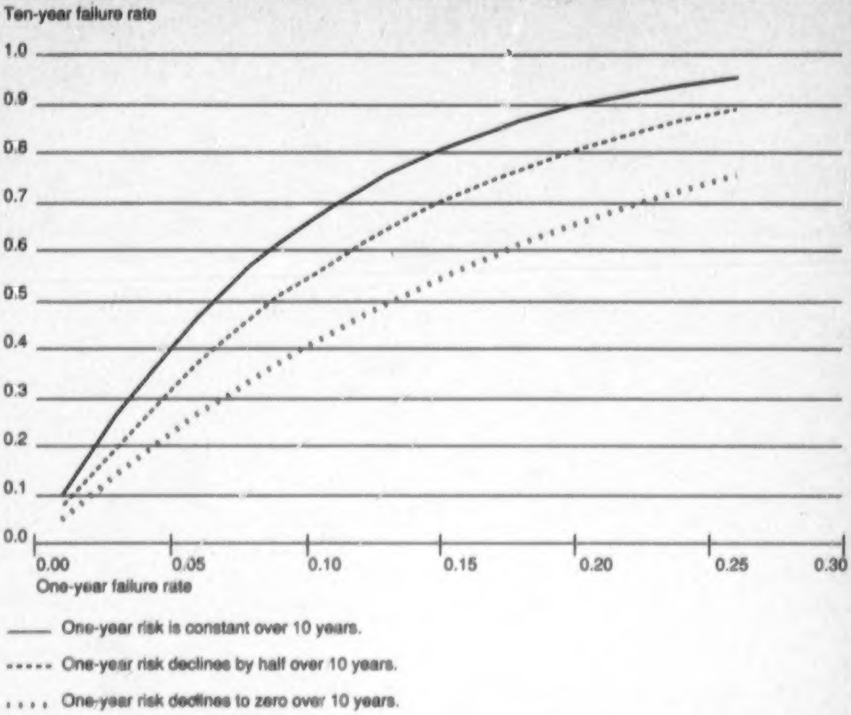
‡Clinical data for the newer IUDs have shown lower risks than the six percent listed in Table 1—i.e., less than five failures per 100 users at the end of four years for the TCu 380A (available in the United States), the TCu 220C, the Nova T and the MLCu 375 (see: reference 6, p. 55). The equivalent one-year failure rate is 1.27 percent, and if this rate is constant over time, the 10-year equivalent is 12 percent.

Individuals will fall at various points on the curves shown in Figure 1, and couples can adopt strategies to locate themselves more favorably. These include switching to a more reliable method, using the current method more conscientiously and reducing coital frequency. (Involuntary events can also intervene, such as the loss of fecundity by either partner; periods of noncohabitation during marriage; and separation, divorce or death of a spouse.) Risks are highest among young couples because of high levels of fecundity and ambivalence regarding contraceptive use, although these are partly offset by the lower average coital frequency found among single persons. Among older couples, average risks are lower overall, but considerable variation exists among subgroups. Older couples who consider themselves fully fecund must assume that they fall on one of the higher curves in Figure 1.

The numbers of unplanned pregnancies that couples might experience under the various assumptions are suggested by simulation calculations.[12] Controlling for other determinants of the reproductive process, the average woman who finishes childbearing with 12–13 years remaining in her reproductive career will experience 0.7 pregnancies using a contraceptive that is 95 percent effective, 1.3 pregnancies with one that is 90 percent effective and 2.3 pregnancies with a method that is 85 percent effective. Examined another way, couples who desire three children and are using a contraceptive that is 95 percent effective will have an average of 3.6 children—a 20 percent overrun in unwanted childbearing.

Thus, in the absence of improved contraceptive technology, unwanted childbearing and abortion will continue to occur in response to contraceptive failure. Very careful and conscientious use of contraceptive methods can reduce but not remove the risks of pregnancy. Large and diverse populations, with mixed levels of education and personal skills, cannot be expected to attain near-perfect use of methods that require skill and discipline. Only sterilization, as a method with a minimal long-term risk of failure, offers escape from the choice of abortion versus unwanted childbearing. Sterilization is, of course, appropriate only for those couples who are absolutely certain that they never want another child; however, where desired family size is small and is attained at relatively early ages, as in the United States, the prevalence of sterilization can rise to a substantial level.

Figure 1. Relationship of one-year and 10-year contraceptive failure rates



Four conclusions follow from this analysis. First, in actual practice, almost every contraceptive method carries a nontrivial annual risk of accidental pregnancy. Second, this risk mounts to a surprisingly high level of failure in the long term, even with allowance for declines in the annual risk. Third, the long-term risk should be taken into account not only by persons finished with their childbearing but also by younger individuals who have many years of sexual exposure before their first wanted birth. Fourth, although the better contraceptive methods drastically reduce the numbers of unplanned pregnancies, couples will experience a substantial amount of unwanted childbearing in the absence of abortion. Sterilization reduces the long-term failure rate to nearly zero but is inappropriate for many people, who therefore must depend upon the less effective temporary methods.

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DIGEST

Noncustodial Fathers Can Probably Afford to Pay Far More Child Support Than They Now Provide

Divorced, separated or unmarried fathers who do not have custody of their children earned, on average, more than $19,000 in income in 1983, but it is argued that relatively little of this money went toward the support of their children.[1] Noncustodial fathers paid almost $7 billion in child support in that year, but an estimate of their ability to pay indicates that they could probably afford to contribute at least $23 billion each year toward their children's support.

Data from the U.S. Bureau of the Census indicate that only 60 percent of noncustodial fathers are legally obligated to pay child support, that only half of these pay the full amount mandated and that one father in four pays nothing. However, it is difficult to know how much noncustodial fathers are able to pay, because there are no good data on the characteristics or income of these fathers. To resolve this problem, two researchers devised an indirect method for making income estimates that is based on regression analysis linking the characteristics of wives with their husbands' income; the approach is then modified according to assumptions about how the relationships between the income and characteristics of parents who are not currently married or cohabiting differ from those of married couples.

The researchers used their new method to analyze data from the April 1979 Current Population Survey of Child Support Supplements (CPS-CSS), the first national survey to study families eligible for child support. There were 3,547 women in the survey with children under 18 whose fathers were absent from the home; all were deemed potential recipients of child support.

The mean income of noncustodial fathers in the United States (in 1983 dollars), the investigators estimate, was $19,346 ($22,533 among whites and $11,285 among blacks). In comparison, Census Bureau data indicate that the average income that year among all men in the prime earning ages of 25–64 was $22,482. Thus, the income of noncustodial fathers was about 14 percent less than that of all men in their prime earning years. The analysis also reveals substantial differences by the custodial parent's current marital status. Among women who had never been married, the noncustodial father's mean income was only $7,775 ($9,952 among whites and $6,285 among blacks); in contrast, among women who were divorced, the overall mean income of the noncustodial father was $23,600 ($24,760 among whites and $17,824 among blacks), and among those who had remarried, the mean was $25,006 ($25,379 among whites and $21,261 among blacks).

Several approaches were used to check the validity of these estimates. For example, 20 percent of the respondents to the CPS-CSS reported the noncustodial father's income; for these cases, the income predicted by the investigators' methodology was two percent greater than the actual income reported by the white respondents, while the estimated income among blacks was 20 percent lower than observed income. In another attempt to check their estimates, the researchers relied on data from the Michigan Panel Study of Income Dynamics (PSID), a longitudinal study begun in 1968. Approximately 700 men in this data set were divorced or separated from their wives between 1968 and 1980 and had dependent children who were not living with them. The researchers' technique estimated a mean income that was one percent lower than the income figure that the white fathers actually reported in the PSID, and a mean income among the black fathers that was eight percent lower than that reported. Finally, through a 1980 random sample of 2,021 Wisconsin women receiving Aid for Families with Dependent Children, a total of 2,259 noncustodial fathers could be identified, and tax records were used to gather income information on 1,468 of these men. The estimation technique projected an annual income 11 percent lower than what was reported among white fathers in this group, and an income 25 percent lower than what was reported among black fathers. After investigating potential sources of bias, the researchers observe that, if anything, the reported incomes most likely are somewhat overestimated.

Thus, the income of noncustodial fathers in the United States in 1983 was probably around $19,000. Given this level of annual income, the investigators then set out to examine how much child support such fathers might be expected to pay. As they point out, the amount of support a noncustodial father is expected to pay depends not only on his income, but also on norms regarding what percentage of a person's income should go toward the support of a child. To cover a wide range of possibilities, they identified three widely varying state standards for child support awards: that of Wisconsin, which is a straight percentage of the noncustodial father's gross income based on the number of dependent children; that of Colorado, in which support is calculated according to the combined income of both parents, with the percentage declining as income increases; and that of Delaware, which takes both parents' incomes into consideration, and which also allows for a number of exemptions before support is calculated (including exemptions for taxes, work-related expenses and any new dependents of the noncustodial father).

The implications of each of these three standards for the noncustodial father's ability to pay child support were calculated using a special simulation methodology. Although the cases of Wisconsin and Colorado were fairly straightforward, the simulation of Delaware's standard was particularly complex, because several new pieces of information—such as the number of new dependents of the noncustodial father and each parent's net income—had to be estimated.

The results of the calculations revealed that noncustodial fathers should be able to pay between $23 billion and $30 billion in child support, depending on the standard used. Yet, in 1983, noncustodial fathers were under court order to pay a total of only $9.7 billion, and had actually paid just $6.8 billion. The investigators also estimated the percentage of noncustodial fathers who, because of low income or some other reason, would not be obliged to provide child support. Because the requirements of the Wisconsin and Colorado standards are so simple, all of the fathers would have some obligation, while under the Delaware standards, 26 percent of the fathers would not be obligated to pay child support. Nationally, however, 51 percent of noncustodial fathers were exempted by the courts from making child support payments in 1983, and a total of 63 percent made no such payments in that year.

Even under the lowest standard of support examined (that of Delaware), the researchers observe, "noncustodial fathers can afford to pay about two and one-half times their current legal obligations and more than three times what they are actually paying." Only if the investigators' income estimates were substantially too high or if, on average, Americans thought that noncustodial fathers should be obligated to share less of their income than is required under the three sample standards could these estimates be considered overstated. The investigators conclude by asking, "Can noncustodial fathers afford to pay substantially more child support? Assuming our methodology is anywhere near correct, the answer is clearly yes."—*M. Klitsch.*

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Serologic Testing Reveals Higher Than Expected Herpes Virus Infection Rates in U.S. Population

By 1980, 25.4 million Americans aged 15–74 (or about 16 percent of all those in that age-group) were infected with the genital herpes simplex virus type 2 (HSV-2).[1] A nationally representative study based on serum collected in the late 1970s found that blacks had higher rates of infection than whites and that women had higher infection rates than men (although the latter difference was significant only among blacks). The prevalence of HSV-2 was higher among persons who were separated, divorced or widowed, among those with lower incomes, among those living in cities and in the South, and among men who had served in the armed forces. It is not known whether these patterns have continued through the 1980s; however, estimates of herpes prevalence based on recent studies range from 25 to 60 percent.[2]

The prevalence of herpes infection among various groups was determined by performing serologic tests for antibodies to HSV-2 in serum samples from 4,201 participants in the second National Health and Nutrition Examination Survey, which was conducted between 1976 and 1980. Serum samples were available for 9,943 persons from a larger group of 27,801. Of these, the investigators selected 785 children aged 1–14 and 3,416 persons older than 14. (The serum samples from children aged 1–10 were used as controls for the specificity of the HSV-2 antibody testing because of the low prevalence of antibodies in this age-group.) The total sample of 4,201 participants comprised 2,731 whites, 1,250 blacks and 220 persons of other races. The investigators note that the sensitivity of the test is greatest in persons infected in the more distant past.

The rate of HSV-2 infection increased with age for all groups except white males. Only two of the 785 children aged 14 and younger had evidence of HSV-2 antibodies, but the rate increased to seven percent among those aged 15–29 and to 20 percent among those aged 30–44. A gradual increase continued, reaching 23 percent overall among those aged 60–74.

Among all participants aged 15–74, herpes prevalence varied according to sex (13 percent among males vs. 19 percent among females), race (13 percent among whites vs. 41 percent among blacks) and marital status (14 percent and 16 percent of those who were single and married, respectively, vs. 35 percent among those who were previously married). Prevalence also was related to income (13 percent among those earning $15,000 or more per year vs. 19 percent among those earning less), education (15 percent among those with at least a partial college education vs. 21 percent among those who did not attend college at all), residence (15 percent among those outside metropolitan areas and 12 percent among suburban residents vs. 24 percent among urban dwellers), region (13 percent among those from the Midwest vs. 16–17 percent among those from the Northeast and West and 20 percent among those from the South). Among men who had served in the military, the prevalence of infection was 19 percent, compared with 11 percent among those who had not served.

A multivariate analysis showed that only race, sex and marital status remained significantly associated with HSV-2. Among adults 30 or older, the prevalence reached nearly 20 percent among white men and 25 percent among white women, but was higher than 40 percent among black men and higher than 60 percent among black women. The odds ratio for HSV-2 infection among black men relative to white men was 3.2, after adjustment for all significant demographic variables. Among women, the odds ratio for blacks compared with whites was almost twice as high (6.1). White women had higher rates of HSV-2 infection than white men at all ages except 40–49 (possibly related to the higher rates among men who had served in the armed forces), while black women had higher rates of infection than black men at all ages. Among blacks, women had an odds ratio of infection of 2.2 relative to men. Regardless of race, previously married persons had an odds ratio of 1.9 relative to married persons.

Other studies have confirmed a higher prevalence of HSV-2 and other sexually transmitted diseases among blacks than among whites, but new data suggest that these differences may be narrowing. Since 1980, when these samples were collected, several studies have indicated large increases in the rate of HSV-2 among whites,[3] while others have suggested a stabilized rate among blacks.[4] This trend reflects the greater change in sexual activity among whites relative to blacks: The proportion of single, urban white women aged 15–19 who reported having had sex increased from 23 percent in 1970 to 42 percent in 1979, while among comparable black women, the increase was from 52 percent to 65 percent.[5]

The investigators suggest that the higher prevalence of infection among women than among men suggests that women may have an increased biological susceptibility to the virus, possibly related to female anatomy or hormone function. Other factors that may affect prevalence include biologic and genetic differences among individuals, number of sex partners, frequency of intercourse, abstinence during periods of viral replication and the use of barrier contraceptives.

Although genital herpes is not a disease that is required to be reported to health officials, survey data reported by the Centers for Disease Control between 1966 and 1984 indicated a 15-fold increase in private patient consultations for herpes.[6] Even more alarming are the data suggesting the spread of silent HSV-2 in the general population. Researchers suggest that asymptomatic transmission may occur in as many as 75 percent of cases. Among upper-middle-class populations in Los Angeles, Seattle and Atlanta, 25–35 percent of women without a history of herpes symptoms tested positive for HSV-2.

The prevalence of silent infection among women seriously complicates prevention of neonatal herpes transmission. Since viral shedding may occur one day and not the next, physicians recommend careful examination for lesions in pregnant women and a culture at the time of labor to determine whether a cesarean should be performed. If it is known that a woman has herpes, and if the infection is recognized in the infant at birth, prompt antiviral therapy can prevent neonatal retardation, illness or death. The safest procedure would be to conduct serological tests for herpes in all pregnant women, but so far no such test is available commercially.—*M. Witwer*

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Performing a Second Ultrasound Exam Markedly Improves Prenatal Detection of Fetal Malformations

In a recently completed study, routine ultrasound screening of pregnant women not known to be at risk of fetal abnormality detected nearly three out of five malformed fetuses. When ultrasound examination was performed twice during pregnancy, it was more than 50 percent more effective at detecting abnormal fetuses than when it was performed just once. Further, urinary tract malformations, which usually require postnatal surgery, were detected in most of the cases when screening was undergone twice; such malformations were apparent in newborns in only one out of four instances.[1]

Between July 1980 and January 1988, obstetricians or midwives at a hospital in Hämeenlinna, Finland, performed routine ultrasound examinations on 9,012 pregnant women. Until 1983, these examinations were conducted primarily to determine gestational age, number of fetuses and location of the placenta; during that period, ultrasound examination was performed only at 18 weeks' gestation. In the remaining years of the study, the women underwent sonography at both 18 weeks and 34 weeks. During the latter period, the researchers measured fetal growth and systematically examined fetal anatomy as well. Throughout the study, all women, not just high-risk women, were examined.

Ninety-three malformed fetuses with 123 major abnormalities were observed during the course of the study. Sixty-five of those abnormalities had been detected by ultrasound, yielding a detection rate of 53 percent; 58 percent of the malformed infants were identified in this manner. Although the sensitivity of routine ultrasonography was thus not high, there were only five instances of false positive results, producing a specificity of almost 100 percent. These five were all cases of fetuses with slight kidney defects that apparently resolved spontaneously.

Sonography revealed fetal anomalies before 24 weeks of gestation in 39 percent of the 54 abnormal fetuses. During the initial period of the study, when ultrasound examination was performed only once, 10 of 24 (42 percent) of the malformed fetuses were seen to be abnormal; in the later period, anomalies were detected by means of ultrasound in 44 of 69 cases (64 percent). The researchers credit greater accuracy in the diagnosis of urinary tract malformations with the increased success in the later period.

Thus, of the 123 fetal anomalies discovered in the course of the study, only slightly more than half were successfully diagnosed by means of ultrasound. In half of the remaining instances, however, sonography revealed an abnormality in some other structure, inconclusive evidence of a structural malformation or other indications of fetal abnormality, such as irregularities in amniotic fluid volume or fetal growth. Generally, the malformations not diagnosed by means of ultrasound were either minor problems (usually with a good prognosis) or serious chromosomal or cardiac defects (usually with a poor prognosis).

Twenty-three of the 54 fetuses that were detected to be abnormal survived; 14 were aborted, three died prenatally and 14 died within one month of birth. Of the 39 infants that had undetected abnormalities, 30 survived.

The researchers conclude that ultrasound examination is necessary in all pregnancies, not just in those where an abnormality is suspected. They point out that in this study, at the time that fetal malformation was diagnosed, "an abnormality of pregnancy was suspected clinically in only 25.8 percent of the cases." In addition, in 75 percent of the cases in which a fetus was diagnosed prenatally as having a urinary tract anomaly, routine pediatric examination at birth failed to spot the abnormality. The investigators also note that when systematic ultrasound examination is performed more than once during pregnancy, the chances for successful detection of malformations are greatly improved. Finally, they emphasize that "early diagnosis of fetal abnormalities [is important because it] allows consideration of pregnancy termination for cases with poor prognosis."—*P. Rind*

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One-Third of Infants Born to HIV-Positive Mothers Face Illness or Death During Their First Year of Life

About one-third of infants born to women testing positive for the human immunodeficiency virus type 1 (HIV-1) will themselves either die or show evidence of infection with the AIDS virus one year after birth, according to the results of two very different studies—one conducted in France, in which 62 percent of the mothers were intravenous drug users,[1] and the other in Zaire, in which none of the mothers reported drug abuse.[2] Both studies indicate that AIDS progresses far more rapidly in infants than it generally does in adults. However, infants born to seropositive women in Zaire were far more likely to die during their first year than those in the French study. The researchers conclude that HIV-1 infection may have increased the infant mortality rate in Kinshasa, Zaire, by as much as 15 percent.

Since maternal antibodies to the AIDS virus may persist in an infant for up to a year after birth, investigators in both studies followed infants for at least 12 months. In the French study, 117 infants aged 18–24 months were evaluated; these infants were part of a larger group born to 308 seropositive mothers. Twenty-seven percent (32) of the 117 were seropositive for HIV; six of those infants had already died of AIDS. Of the 32 seropositive infants, only two remained without symptoms, while 19 developed severe forms of HIV infection and 11 had nonspecific symptoms. Among the remainder of the 117, 65 percent were seronegative and free of symptoms, while eight percent were seronegative but had symptoms possibly related to HIV infection.

The route of delivery (vaginal or cesarean section) did not appear to have influenced the risk of infection in infants, but the researchers noted that they did not have detailed information about the rupture or status of the membranes at birth or the degree of infants' exposure to maternal blood. Increased risk was associated with breastfeeding, however: Five of the six infants who were breastfed developed antibodies to HIV, compared with 25 of 99 who were bottle-fed (significant at $p<0.01$). (All seropositive mothers had been advised against breastfeeding.) Since so few infants were breastfed, the investigators suggest that larger studies will be needed before an association can be assumed.

Of the 308 mothers who formed the larger study group, 62 percent probably had acquired the infection as a result of intravenous drug use, while 31 percent were thought to have been infected by male sex partners. (Many of the latter group came from Haiti or Central Africa.) Three percent of the women had had blood transfusions before 1985, and eight percent of the women had more than one risk factor.

The infection rate and the ultimate outcome for the 117 infants did not appear to be influenced by how the mothers had acquired the infection. Furthermore, neither drug-withdrawal symptoms in infants nor active drug use by the mothers during pregnancy altered the risk of perinatal infection. The researchers conclude that there were too few women with symptoms of HIV infection to allow for comparisons based on the clinical status of the mothers.

Although the HIV-infected infants in this study did not differ at birth from the non-infected infants (of seropositive mothers) with regard to weight, height, head circumference or rate of malformations, such characteristics were different among infants of drug-using mothers. Among infants of the same mean gestational age, those whose mothers used drugs were shorter, were of lower birth weight and had smaller head circumferences. Furthermore, nine of the 10 infants with structural abnormalities (including four cases of cleft palate) were born to women who used drugs. In contrast, infants of mothers infected heterosexually were of average height and weight and had a rate of malformations comparable to those of infants in the general population.

The researchers conclude that about one-third of infants born to seropositive mothers can be expected to show evidence of HIV, and that 20 percent of these babies will die by the age of 18 months. The progression of the disease is far more rapid in infants than in adults: The rate of diagnosis of AIDS among HIV-positive, symptom-free adults is about 2–5 percent per year, whereas 59 percent of the HIV-positive infants had severe disease by the age of 18 months. The researchers note that new methods used to detect the HIV genome will improve diagnosis of HIV infection and permit earlier treatment.

In the other study, investigators in Zaire conducted HIV-1 screening among 8,108 women who gave birth at one of two Kinshasa hospitals that serve populations of markedly different socioeconomic status. The proportion of seropositive women (about six percent) was similar at both hospitals; 85 of the seropositive women already had AIDS, but none reported a history of drug abuse.

For one year, the researchers followed 475 infants born to 466 seropositive women (329 who delivered at a hospital serving predominantly low-income women and 137 who delivered at a hospital serving a higher income population). The investigators also followed a group of 616 controls—infants born to 606 seronegative women who were matched with the experimental group for age, parity and hospital. After one year, 21 percent of the infants of seropositive mothers had died and eight percent of the surviving infants had AIDS, whereas only four percent of the control infants had died. Furthermore, 39 percent of a subsample of 92 infants born to seropositive mothers had evidence of HIV-1 infection 12 months after birth. Although the mortality rate at one year is much higher in this study than in the French study, the combined rate of morbidity and mortality for infants born to seropositive women was remarkably similar to the rate of 27 percent found in the French study.

Infants born to the 85 women with AIDS were at a clear disadvantage at birth: Thirty-three percent of these newborns weighed less than 2,500 g, compared with only 17 percent of those born to mothers with asymptomatic infection and 10 percent of those born to seronegative control mothers (significant at $p<0.001$). Infants of women with AIDS were also more likely to have a low gestational age at birth, a low ratio of head circumference to height and chorioamnionitis than were infants of the other two groups of mothers. Babies born to seropositive women were also more likely than controls to be premature, to be of low birth weight and to die during their first 28 days. Those born to women with severe symptoms of HIV infection were at even higher risk.

The increased rate of prematurity contributed greatly to the higher overall death rate among infants born to seropositive mothers. During their first year of life, 100 infants born to seropositive mothers died—29, as neonates (62 percent of these were premature). The other 71 infants died later, either from AIDS (34 percent), diarrhea (21 percent), pneumonia (12 percent), meningitis (eight percent) or other causes (25 percent). In contrast, of 23 deaths among infants born to seronegative mothers, only one in eight neonatal deaths was attributed to prematurity. There were 15 postneonatal deaths: six percent were attributed to prematurity, 27 percent were caused by diarrhea, 20 percent by meningitis, seven percent by pneumonia and 40 percent by other conditions.

Of the original 475 infants born to seropositive women, seven were stillborn and another 27 were lost to follow-up. Twenty-seven of the remaining 341 who survived their first year (eight percent) had AIDS.

In an effort to discern the means of perinatal HIV transmission, 92 randomly selected umbilical cord blood samples from infants of seropositive women were tested for seropositivity, and T4-cell counts were performed in 37 of these women. The researchers found that eight of the 19 infants with positive umbilical cord blood cultures died during the first year of life, compared with just 14 of 73 infants with negative umbilical cord blood cultures. In addition, seropositive women with low absolute T4-cell counts were more likely to have an infant with a positive cord blood culture: Six of 18 women with antenatal T4 counts of fewer than 400 cells per cubic millimeter had an infant with a positive culture, while none of the 19 women with antenatal T4 counts above that level did. Further, infants born to mothers whose placenta showed severe chorioamnionitis were approximately twice as likely to have contracted perinatal HIV-1 as were those born to mothers without this symptom.

Mortality rates among children born to seropositive and seronegative mothers at the two hospitals differed considerably, partly because of differences in socioeconomic status and partly because of the higher prevalence of women with AIDS or AIDS-related symptoms at the hospital serving the lower income population. The researchers conclude that if six percent of all women in Kinshasa are seropositive for HIV-1, as their study suggests, the infant mortality rate in the city may have already increased 15 percent as a result of HIV infection.

Fellow researchers observed in an accompanying editorial[3] that although the heterosexual spread of HIV infection in Western countries has not approached the levels reported in some African nations, the effects on pregnant women and their offspring are similar. They predict that attempts to prevent transmission of HIV during pregnancy, delivery and the perinatal period, guided by new methods of virus detection, will raise major ethical issues for practitioners. Treating perinatal AIDS will be even more challenging, they say, because of the complex pharmacologic and immunologic interactions between the mother, placenta and fetus and the dynamic changes during the neonatal period.—*M. Witwer*

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Pregnant Women's HIV Status Does Not Affect Their Abortion Decision

Pregnant women aware that they are infected with the human immunodeficiency virus (HIV) are about as likely to choose to have an abortion as they are to carry the pregnancy to term, according to a study of a small sample of intravenous drug users in New York.[1] Such women are also no more likely than those who are not infected to terminate their pregnancy. Even seropositive women worried about the risk of passing the virus on to their fetus are as likely as not to give birth. The factors most closely associated with a woman's pregnancy decision are unrelated to HIV-antibody status: whether the pregnancy was planned, the woman's reaction to her pregnancy and whether the woman has ever had an abortion.

In September 1985, investigators began studying a sample of 64 pregnant women drawn from a longitudinal study of intravenous drug users enrolled in a methadone treatment program in the Bronx. All eligible women (those who had been tested for HIV and told of the results before 24 weeks' gestation and who had been pregnant previously) from the larger study were invited to participate. Thirty-one percent of the 64 women were white, 20 percent were black and 48 percent were Hispanic. Sixty-three percent were married, and 20 percent had had a prior elective abortion. Nearly all (88 percent) were enrolled in Medicaid.

Through the longitudinal study, the women had received counseling on AIDS, HIV infection and transmission, and the meaning of HIV test results, both before and after they were tested for HIV. The 64 women in the smaller study were also told that a seropositive woman has a 30–50 percent chance of transmitting HIV to her infant, and that an infected woman's condition may worsen clinically as a result of pregnancy. All were offered the choice of a referral for abortion or receipt of prenatal care through the clinic associated with the methadone program. At least two months after the pregnancy outcome (8.5 months, on average), 36 of the 64 women were interviewed about their decision and their attitudes toward their pregnancy; the investigators were unable to obtain interviews with the remaining women.

Forty-four percent of the 64 women were seropositive for HIV. The seropositive and seronegative women did not differ significantly according to any characteristic except race or ethnicity: A higher proportion of HIV-negative women were white (44 percent) than were HIV-positive women (14 percent). None of the seropositive women had advanced, symptomatic HIV-related disease.

Fifty percent of the seropositive participants chose to terminate their pregnancy, as did 44 percent of the seronegative women. In general, the earlier women were told of their HIV-antibody status, the more likely they were to have an abortion. For example, eight of 12 seropositive women and 12 of 21 seronegative women who were informed of their HIV-antibody status before pregnancy elected to have an abortion; in contrast, among those informed between 13 and 24 weeks' gestation, two of six seropositive women and one of eight seronegative women chose to terminate the pregnancy.

The only variable that significantly predicted a woman's decision, regardless of her HIV-antibody status, was whether she had ever had an abortion: Overall, 10 of the 13 women who had had an abortion chose to terminate their current pregnancy, compared with 18 of the 47 women who had never had an abortion.

Of the 36 women interviewed after pregnancy, 14 were seropositive and 22 were seronegative. Seven of the former had chosen to have an abortion, as had 10 of the latter. Thus, 17 of these women had terminated their pregnancy, while 19 had not. Four of the seropositive women said their pregnancy had been planned, and 10 said it had been unplanned; among seronegative women, the numbers were eight and 14, respectively. Sixteen of the 17 who had had an abortion said their pregnancy had been unplanned, compared with eight of the 19 who had chosen to continue their pregnancy.

In addition, women who had chosen abortion were significantly more likely than those who had continued the pregnancy to recall having had a negative reaction to the pregnancy: Three of the former had been happy and 14 had been sad, upset or scared. Among those who had decided not to have an abortion, on the other hand, 15 had been happy about the pregnancy and four had been unhappy. Nine of the 14 seropositive women and 11 of the 22 seronegative women said that the decision about whether or not to have an abortion had been difficult. However, regardless of their HIV-antibody status, the women who had chosen abortion were more likely to have found their decision difficult: Fourteen of the 17 who had chosen to have an abortion characterized their decision as hard or difficult, compared with just six of the 19 who had carried their pregnancy to term.

All 36 women believed the risk of HIV transmission from a pregnant woman to her fetus to be at least 50 percent. Twelve of the 14 seropositive women believed that their own risk of transmitting HIV to their fetus was greater than 50 percent; nevertheless, six of these women had chosen to carry their pregnancy to term. Thirteen of 14 seropositive women said they had been "scared of getting AIDS" during their pregnancy; seven of the 22 seronegative women had shared this fear. However, seven of the 13 seropositive women had chosen to carry their pregnancy to term. Furthermore, six of the seropositive women said they had had problems sleeping during pregnancy because of their fear of AIDS, yet four of them had chosen to continue their pregnancy.

Although the study sample was small, the investigators conclude that HIV-antibody status does not consistently seem to have influenced the women in deciding whether to have an abortion, even when they were acutely aware of the risk of transmission. Half of all the seropositive women chose to continue their pregnancy, as did half of the seropositive women who perceived the risk of transmitting HIV to their fetus as 50 percent or greater. Although the fear of having an infant with AIDS was mentioned as an important reason for terminating their pregnancy by four of the seven seropositive women who did so, a greater number chose to continue their pregnancy based on more compelling reasons such as desire for a child, religious influences and family pressure. The only significant predictor of pregnancy termination for the sample as a whole was whether the women had ever had an abortion. Within the subsample who were interviewed, the circumstances surrounding the pregnancy and the woman's attitude toward it were the only variables associated with her decision. The authors conclude that "while knowledge of HIV infection might lead to a decision to terminate pregnancy in some cases, and while counseling efforts to promote informed decision-making must be pursued, there might be more important determinants of pregnancy choice that must be addressed among at-risk women."—*P. Rind*

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Physician Factors Play Key Role in Determining Cesarean Section Rates

Cesarean section rates can vary widely from physician to physician, and much of the differential may be attributable to individual practice styles. According to one recently published study,[1] the identity of the physician has the second greatest impact on the rate of cesarean section, exceeded only by whether the woman is having her first delivery. First-time cesarean rates ranged from 10 percent to 32 percent among the 11 physicians who were studied. Another similar study examined the effects of specific physician characteristics and suggested that older, more experienced physicians perform significantly more forceps deliveries and significantly fewer cesarean sections for dystocia or failure to progress, the primary indication for the procedure.[2]

In order to minimize the number of factors that might influence cesarean section rates, both studies examined the incidence of cesarean deliveries within a relatively homogeneous population—private patients at low risk for obstetric complications. In the first study, researchers analyzed data from 1,533 deliveries performed by 11 obstetrician-gynecologists (ob-gyns). The deliveries occurred over a one-year period at a community hospital in an affluent suburb of Detroit. To identify the determinants of the cesarean section rate, stepwise regression analysis was used to evaluate data from the patient log on the mode of delivery and perinatal outcome. The identity of the physician, parity, birth weight and maternal age were controlled for. The physicians were also asked to supply an account of their recent medical-legal experiences so that the influence of the legal climate could be evaluated.

For the 11 physicians involved in the study, rates of cesarean section ranged from 19 percent to 42 percent (the mean was 30 percent). When repeat cesareans were excluded, the rates ranged from 10 percent to 32 percent. The results of the regression analysis indicated that the identity of the physician who performed the operation had a statistically significant effect on the rate of first-time cesarean section ($p<0.001$); only nulliparity had a stronger effect ($p<0.0001$). Neither birth weight nor maternal age had a significant effect, nor did any of the medical-legal variables mentioned by the physicians. Furthermore, the high rates of cesarean section did not visibly reduce levels of neonatal morbidity, which are very low to begin with in low-risk populations.

Since the study design controlled for the patient population (including the level of obstetric risk and the mother's method of payment), the authors suggest that the wide variation in rates is most likely attributable to the individual clinician. According to the authors, their finding implies that the diversity of practice styles "could be an important factor underlying the increasing cesarean section rates." They warn, however, that this finding cannot be considered proven, since the study was limited to just one hospital during one year only. From the available data, the authors could not ascertain whether some obstetricians were overusing the procedure or whether others were underusing it. Nevertheless, the authors recommend implementation of a strategy of physician education on cesarean section similar to the campaign that successfully lowered tonsillectomy rates in the past.

The second study attempted to determine the specific physician characteristics associated with cesarean section rates using data from 6,327 deliveries over a three-year period among private patients at Mount Sinai Hospital in New York City. The information collected on the 48 physicians performing these deliveries included gender, date of birth, residency program and date of completion, and practice status (group or solo).

The majority of the physicians were male (77 percent) and roughly half of the physicians (52 percent) worked in a group practice. The male doctors tended to be older and more experienced than their female colleagues, and those physicians in solo practice tended to be older and to have had more years of experience than those in group practice. The overall rate of cesarean delivery was 24 percent, with dystocia accounting for the largest proportion of cesarean sections (28 percent). The primary cesarean section rate was 18 percent, while the rate of deliveries requiring forceps or breech extractions (operative vaginal deliveries) was 25 percent.

Regression analysis revealed that the physician's age and experience were positively correlated with the rates of forceps delivery and breech extraction, and negatively associated with the cesarean section rate for dystocia. The investigators comment that these generational differences may simply reflect the fact that more cesarean sections are being performed today for breech presentations or as an alternative to a difficult vaginal delivery, and thus younger doctors may be less familiar with operative vaginal techniques.

The gender of the physician did not have a significant association with the delivery method. However, since male doctors are both older and more experienced, they had somewhat higher overall operative delivery rates and somewhat lower cesarean section rates for dystocia than did female physicians. These differences were not statistically significant, however, probably because of the small number of female physicians in the sample. The authors note that further study on the links between physician gender and cesarean delivery rates should be conducted once more female ob-gyns are practicing.

Although solo practitioners had higher primary cesarean rates, there was no significant effect on operative delivery rates by the type of medical practice, a fact that the authors suggest might change if a larger sample were to be tested. (Unlike the Detroit study, the Mount Sinai study did not test for the influence of the medical-legal climate on rates of cesarean section, although the authors mentioned its possible effect.) In addition, the authors cite several other physician characteristics that might influence the decision to perform a cesarean section, including the physician's personality, medical knowledge and history of previous prenatal outcomes. They also noted that the physicians in the study constituted a fairly homogeneous population and that other studies should be done among physicians with more diverse backgrounds and characteristics.

Like the Detroit investigators, the authors of the Mount Sinai study discuss strategies that would lower cesarean section rates without jeopardizing perinatal outcome. In addition to feedback from professional committees and institutional standardization of clinical policy that could reduce recourse to surgery, the authors list such recommendations as mandatory second opinions before surgery, the establishment of peer-review panels and continuing education for physicians.—*L. Remez*

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Oral Contraceptive Use Does Not Raise Lipids Above Normal Levels

The use of triphasic oral contraceptives does not appear to affect lipid and lipoprotein metabolism to a degree that would place most women at high risk of cardiovascular disease, regardless of the type of progestogen used; although the formulations tested in a recent study raised levels of serum cholesterol and triglycerides somewhat, the levels remained well within normal ranges.[1] Moreover, a separate study comparing the effects of pills containing varying dosages of norethindrone and ethinyl estradiol on concentrations of serum lipids and lipoproteins found few differences.[2]

The first study compared two triphasic preparations containing the same estrogen (ethinyl estradiol) but different progestogens (levonorgestrel or norethindrone[*]), and measured changes in plasma lipids and lipoproteins over 12 months. The investigators enrolled 80 volunteers who were 21–35 years old, in good health, within 10 percent of desirable body weight and at least 90 days postpregnancy. These women also had regular menstrual cycles, did not smoke or consume alcohol to excess and had no contraindications to oral contraceptive use, such as thrombophlebitis, past or present thromboembolic disorders, cerebral vascular or coronary artery disease or previous estrogen-dependent tumors (breast or endometrial cancers). Screening included a complete history and physical examination, a Pap smear and blood and biochemical profiles.

In all, 38 women were randomly selected to receive the preparation containing levonorgestrel, and 42 were assigned to take the triphasic containing norethindrone. Each woman was asked to keep a record of other medications she took during the study, as well as of withdrawal or intermenstrual bleeding or side effects. Fourteen women who met the study criteria and who either were sterilized or were using a nonhormonal contraceptive method were recruited as controls.

Blood samples were taken at baseline and again after six and 12 cycles of oral contraceptive use, and levels of total cholesterol, triglycerides, high-density lipoprotein (HDL) cholesterol, low-density lipoprotein (LDL) cholesterol and two types of apolipoproteins were measured. The investigators also calculated ratios of total cholesterol to HDL cholesterol, of HDL to LDL cholesterol, and of apolipoprotein A_1 to apolipoprotein B.[†] These ratios are now thought to be the best predictors of cardiovascular risk.

Of the original participants, 29 women taking the levonorgestrel-containing pill, 33 taking the norethindrone-containing formulation and 11 controls completed the study. Because of incomplete data, two more subjects taking the levonorgestrel-containing pill and three more of those taking the norethindrone-containing pill were excluded from the 12-month analysis. There were no significant differences in baseline characteristics among the groups. No significant changes in blood pressure or weight occurred during the course of the study. Side effects were those usually associated with oral contraceptive use and were similar in each pill group.

The two groups of pill users experienced similar increases in triglyceride levels at six months; at one year, triglyceride levels had declined somewhat, but were still higher than they had been at baseline. The 12-month triglyceride levels in both groups were significantly higher than those found in the control group, but they remained within the normal range.

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[*] The levonorgestrel-containing triphasic contraceptive consisted of consecutive doses of 50, 75 and 125 mcg of levonorgestrel and doses of 30, 40 and 50 mcg of ethinyl estradiol. The norethindrone-containing preparation consisted of doses of 0.5, 0.75 and 1.0 mg of norethindrone and a steady level of 35 mcg of ethinyl estradiol.

[†] Because LDL cholesterol and apolipoprotein B are atherogenic and HDL cholesterol and its components, including apolipoprotein A_1, are antiatherogenic, the ratios of these substances to each other and to total cholesterol are considered more important than concentrations of total cholesterol and total triglycerides in assessing cardiovascular risk.

In both pill groups, there were significant increases in total cholesterol at six months but very little change thereafter. Cholesterol levels for the pill groups did not differ significantly from each other or from those of the controls at either test point, with levels for all groups within the normal range.

Levels of total HDL cholesterol were unaffected at six months and showed no significant differences either within or among groups at 12 months. However, at 12 months, concentrations of the HDL subfraction HDL_2 in both pill groups were significantly lower both within groups and in comparison with the control group. LDL cholesterol increased in both pill groups at six months and changed little thereafter. Levels of all lipoproteins except HDL_2 were within clinically acceptable ranges. Concentrations of apolipoprotein A_1, the major protein component of HDL cholesterol, rose significantly in both pill groups in the first six months, climbing to the upper limit of the normal range and in some cases exceeding it. These increases were highly significant both within groups and in comparison with the controls. However, at 12 months, circulating levels of this protein had decreased to a level no longer significantly different from that of the controls. Both pill groups showed similar increases in apolipoprotein B at six months, followed at 12 months by a further increase for the women taking the levonorgestrel-containing pill and a slight decline for those taking the norethindrone-containing pill. The net increases were statistically significant within groups and in comparison with the control group, but they stayed within the normal range. There was no significant difference between the pill groups at 12 months.

The ratio of total cholesterol to HDL cholesterol increased steadily and significantly from baseline to 12 months in both pill groups, but remained within the normal range. There were no significant differences in the ratio of HDL cholesterol to LDL cholesterol within or between groups, nor were there significant differences between the pill groups and the control group. A decline in the ratio of apolipoprotein A_1 to apolipoprotein B was found in all groups at 12 months, but was statistically significant only for the women taking the pill containing levonorgestrel.

Although the investigators conclude that their findings "endorse the relative cardiovascular safety of the two oral contraceptives tested," they caution that because "the individual metabolic response to an oral contraceptive varies, . . . high-risk women taking oral contraceptives should be monitored with annual lipid and lipoprotein profiles."

The second study, which involved 316 women aged 18–35 recruited between October 1985 and October 1987, compared different formulations of pills containing ethinyl estradiol and norethindrone. Participants had to have a regular menstrual cycle, no contraindications to oral contraceptives, no significant endocrinologic, hematologic or metabolic disorders and a body weight within 15 percent of their ideal weight. Women were ineligible if they had been pregnant or had breastfed within six months, if they had used oral contraceptives or sex steroids within the preceding 12 months or if they had taken any other medications that could affect the outcome variables. Each participant was interviewed and given a physical examination. Blood samples were taken after overnight fasting to determine levels of lipids, lipoproteins and apolipoproteins. Each subject was sampled on at least two occasions 48 hours apart. After screening, 65 women withdrew or were excluded from the study.

Subjects were randomly assigned to take one of three pill formulations—50 mcg of ethinyl estradiol and 1 mg of norethindrone; 35 mcg of ethinyl estradiol and 1 mg of norethindrone; or 35 mcg of ethinyl estradiol and 0.5 mg of norethindrone. The three groups were comparable at baseline in prior oral contraceptive use, gravidity and parity, race, menstrual patterns, marital status, smoking, exercise, diet, alcohol intake and past severe illness.

Blood samples were drawn again during the third, sixth and ninth oral contraceptive cycles to determine levels of lipids, lipoproteins, apolipoproteins and plasma steroids. At each of these test points, a follow-up questionnaire and an abbreviated physical examination, including blood pressure measurement, were completed.

Of the 251 women who entered the study, 192 completed nine full cycles of oral contraceptive use. The 59 women who did not complete the study did not differ significantly from those who did except that they weighed, on average, 2.4 kg less. These women were relatively equally distributed among the three groups.

In every group, total cholesterol was significantly higher at nine months than at baseline, with increases ranging from 2.7 percent to 9.2 percent. Women taking the pill containing 35 mcg of ethinyl estradiol and 1 mg of norethindrone showed significantly less change than those taking the other two formulations. Triglyceride levels also rose significantly in all three groups, with no significant differences among the groups.

Women taking the preparation containing 35 mcg of ethinyl estradiol and 0.5 mg of norethindrone showed a 6.6 percent increase in HDL cholesterol, while the other two groups experienced decreases of 2.7 percent and 3.5 percent. There were no significant differences in LDL cholesterol either within or among the groups.

At nine months, levels of apolipoprotein A_1 were significantly higher than at baseline in all three groups. The increase among women using the formulation containing 35 mcg of ethinyl estradiol and 0.5 mg of norethindrone was significantly greater than those for the other two groups. By nine months, levels of apolipoprotein B had risen significantly above baseline in all groups, but there were no significant differences among the groups. The ratio of LDL cholesterol to HDL cholesterol was higher at nine months than at baseline, but none of the groups showed a significant change.

The investigators conclude that at the dosages tested, "few differences among the preparations emerge." They also point out that "although most oral contraceptive users may not face increased risk in the future, there may be subgroups of users whose risk could be different."—*F. Althaus*

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High School Graduation Is More Likely for Those From Small Families

Number of siblings is one of the most influential characteristics in determining whether an individual will complete high school, according to a recent study of white males in the United States.[1] The study also confirms that children from small families tend to have stronger verbal skills than those from large families, and since verbal ability is the best single predictor of future academic achievement,[2] this finding helps to explain why persons with fewer siblings generally complete more years of schooling than their peers from larger

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families. Moreover, the study suggests that as the average family size in the United States continues to decrease, there will likely be a corresponding increase in children's level of education in the coming decades.

Using data from six large-scale national surveys conducted in the United States between 1955 and 1986, demographer Judith Blake assessed the total years of education completed by a group of men aged 25 and older while controlling for the respondent's age as well as for parental background characteristics. Only white males were included in the sample of 63,344 respondents, although results were similar for other men and women. She found a consistent, inverse relationship between level of education and number of siblings, with men from families of one or two children having attained nearly two more years of education than those from families of seven or more.

The most pronounced effect of number of siblings was not on college attendance, but on whether the respondents had graduated from high school: For example, 48 percent more men who were only children had graduated from high school than had those who were from families with seven or more children, whereas 31 percent more only children had attended college. Among family background characteristics, number of siblings was the second most important predictor of the number of years an individual spends in school up to grade 12; father's level of education was the most influential factor. Father's socioeconomic status was the most important predictor of attending college, followed by father's education and number of siblings. In families of seven or eight children, birth order also influenced education: Those born last or next to last had the most schooling, while those born early in the middle part of the sibling distribution (at around parity 3) obtained the least education.

Blake observes that the mean number of children born to women during the current "baby bust" period is actually the lowest since the turn of the century, when a continuous statistical record began. The cohort of women born between 1867 and 1870 had four children, on average, while those born between 1946 and 1950 are having an average of just 2.1 children.[3] She notes, however, that any beneficial effect of smaller family size on education has not yet occurred, because the mean number of siblings in the United States has remained relatively high: Until the mid-1980s, more than 40 percent of children were raised in families with five or more offspring. This discrepancy results from the fact that each new generation derives mainly from families with the most children. According to data from the Current Population Survey (CPS), women who completed their childbearing by 1960 (those born between 1911 and 1915) had a mean of 2.9 children, but the mean number of siblings of children born to those women was 4.3. Data from the CPS indicate that by the year 2001, this difference will have narrowed: Women completing childbearing by that year (those born between 1952 and 1956) will have had 2.4 children, and the mean number of siblings of their children will be 2.8.

The second part of the study looked at the relationship between verbal ability and sibling number among children aged 6–11. The sample included 4,511 white, non-Hispanic children from Cycle II of the Health Examination Survey, which was conducted by the National Center for Health Statistics and was completed in 1965. A standardized intelligence test (the Wechsler Intelligence Scale for Children) that included verbal and nonverbal subtests was used in the study. The analysis controlled for parent education, income and marital status, region of residence, community size and employment status of the mother. High scores on the verbal component of this test were strongly associated with small numbers of siblings, while there was a minimal association (in the same direction) for scores on the block design, or nonverbal component, of the test. Sixty-five percent of all children taking the test had verbal scores higher than the average scores of children with seven or more siblings, while only 38 percent of all those taking the test had scores higher than the average scores of only children. Further analysis based on samples of high school sophomores and seniors who also took tests measuring verbal and nonverbal abilities showed that the relationship between verbal ability and sibling number was not as strong. This was apparently because of higher drop-out rates among children from the largest families.

After controlling for various parental and environmental characteristics, researchers have suggested that superior verbal ability among children from smaller families results from greater interaction and communication with their parents. Blake concludes that "on average, children from large families only suffer certain kinds of ability deficits—those that are associated with lesser levels of adult-child interaction." Unfortunately, since verbal ability is the most important predictor of educational success, this particular deficit has negative consequences for youngsters from large families. Fewer and fewer children in the United States face this potential handicap, however. For the first time in the nation's history, 75 percent of all children are growing up with three or fewer siblings, while fewer than five percent are in families of seven or more. Although other family changes, such as marital instability, may have serious adverse effects on children, smaller family size may at the same time provide greater opportunity for educational success.—*M. Witwer*

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Books in Review

All About Abortion—More or Less

International Handbook on Abortion
ed. by Paul Sachdev, Greenwood Press, New York, 1988, $75.00, 544 pp.

Reviewed by Henry P. David

Planning, organizing and editing an international abortion handbook is a daunting task. Inspired by the ideals of the late Christopher Tietze, to whom the book is dedicated, Paul Sachdev, now professor of social services at Cleveland State University, solicited a collection of useful and relevant chapters on the abortion situation in 31 (mostly European) countries and an overview of trends in Latin America. However, delays, inadequate responses from several contributors and translation difficulties have resulted in inclusion of some obsolete material and in regrettable omissions that detract from the comprehensive coverage and integrative overviews usually expected from a handbook.

The 31 country reports in *International Handbook on Abortion* follow a standard format, usually covering the evolution of abortion policies, current legislation, illegal abortion, attitudes toward abortion, repeat abortions and abortion-related research. Northern Europe is represented by Denmark, Finland, Norway and Sweden. From Western Europe, there are reports on Belgium, the Federal Republic of Germany, the Netherlands and the United Kingdom. Coverage of the socialist countries of Central and Eastern Europe includes Czechoslovakia, the German Democratic Republic, Hungary, Poland and Yugoslavia. Greece, Italy and Israel represent Southern Europe and the Middle East. Country reports from Asia feature Bangladesh, China, India, Indonesia, Japan, Republic of Korea, Singapore and Sri Lanka. Australia and New Zealand are also included. From Africa, there are reports on Nigeria and the Republic of South Africa, both of which have restrictive abortion laws. Canada and the United States are the North American entries, and for Latin America, there is a report from Cuba and an overview of the rest of the region. All but two of the country chapters (China and Cuba) are written by knowledgeable and well-regarded resident specialists.

For readers interested in the status of abortion around 1986 or 1987 in any of the above countries, the *Handbook* is a useful resource. Much of the historical material and public opinion data is not available elsewhere. Specialists will be disappointed by the absence of reports on France, Romania and the Soviet Union, countries whose abortion experience has had a major impact on policies in other lands. In addition, neither Tunisia, the first Arab country to legalize abortion, nor Zambia, the first African country to do so, is included or mentioned in the volume.

The shortcomings in country coverage might have been overcome through an integrative overview of the topic, but the editor's introductory chapter fails to meet the objective indicated by its title, "Abortion Trends: An International Review." There is no historical introduction and no reference to the background material cited in several country reports, particularly those on China and Greece. Although Sachdev acknowledges that the Soviet Union, in 1920, became the first country to legalize abortion on request, he does not mention the reimposition of restrictions in 1936 or the reliberalization in 1955. There is also no mention of the modified abortion law passed in 1955 in Iceland, which introduced the concept of medical-social implications, or of the restrictions recently reimposed in Iran, Israel and Romania.

A comparative survey of the de jure and de facto abortion situation would have been welcome. Although some information is provided in the country chapters, the editor's table with data from 35 countries fails to convey actualities. There are no references to original sources of legislation or to the excellent reviews by other experts on the legal situation and prevailing practices in well over 100 countries. Indeed, the entire overview has only three references. In addition, the incomplete tabulation of abortion-related statistics, which covers 29 countries, cites mostly pre-1985 data. To suggest that Italy has one of the lowest rates of abortion among adolescents in Europe reflects undue reliance on the completeness of officially reported Italian abortion statistics.

Particularly difficult to accept is the editor's assertion that "in European countries abortion apparently continues to be used as a primary method of fertility control as the governments have now diminished emphasis on contraceptive efforts" [p. 5]. To the best of my knowledge, nearly all governments in Europe—with the exception of Romania—are actively trying to reduce the number of unwanted pregnancies and abortions by improving the availability of and access to effective modern contraceptives. Indeed, this concern is one of the reasons why the World Health Organization's European Regional Office, in association with the United Nations Population Fund and the European Region of the International Planned Parenthood Federation, is convening a 1990 conference on "The Abortion Situation in Europe: Prevention and Public Health Concerns."

Another frustrating aspect of the *Handbook* is the lack of information on issues such as the delivery of and access to abortion services for women, regardless of income or local residence; whether these services are provided only in hospitals (with what required length of stay) or in outpatient centers and physicians' offices as well; the use of dilatation and curettage versus vacuum aspiration, menstrual regulation or RU 486 procedures; and second-trimester techniques. In fact, RU 486 is not mentioned anywhere in this volume. The abortion research cited is mostly demographic and biomedical and includes few psychosocial or behavioral studies; however, the findings from opinion polls are reported in several country chapters.

Although the *Handbook* does not completely fulfill all of its original objectives, on the whole, the positives outweigh the negatives. It may well be that what it has achieved is the most that can be accomplished at this time. Its strength is in the reports on individual countries. Although it is neither as comprehensive nor as international as one might have hoped, the *Handbook* does convey important information for cross-national comparisons and is a useful reference. Whether it is worth $75.00 is another question.

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Family Planning

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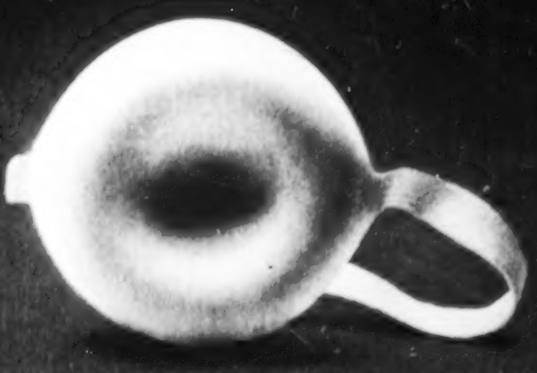

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Volume 22, Number 1, January/February 1990

Family Planning Perspectives

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Postponing Teenage Sexual Involvement

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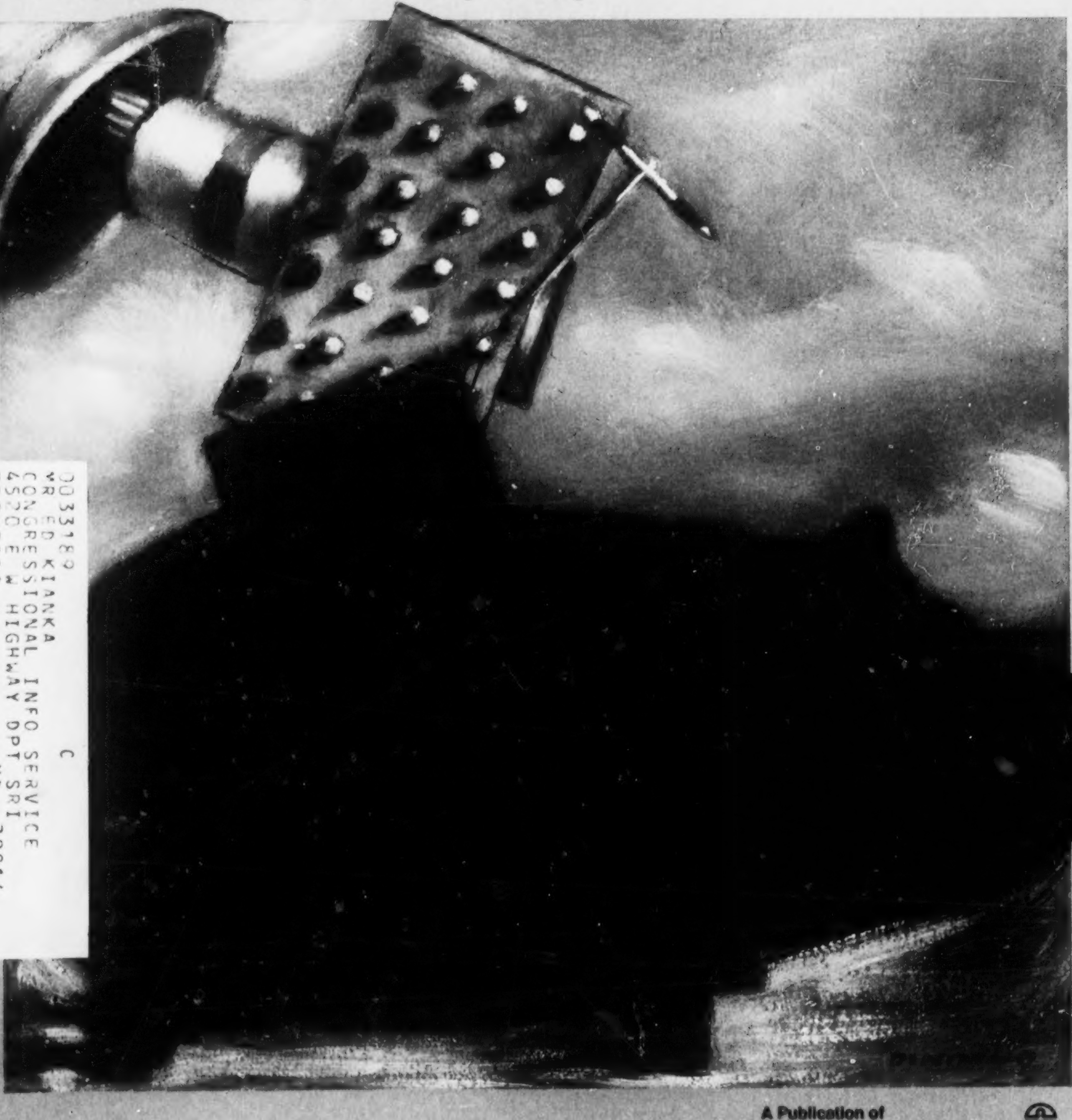

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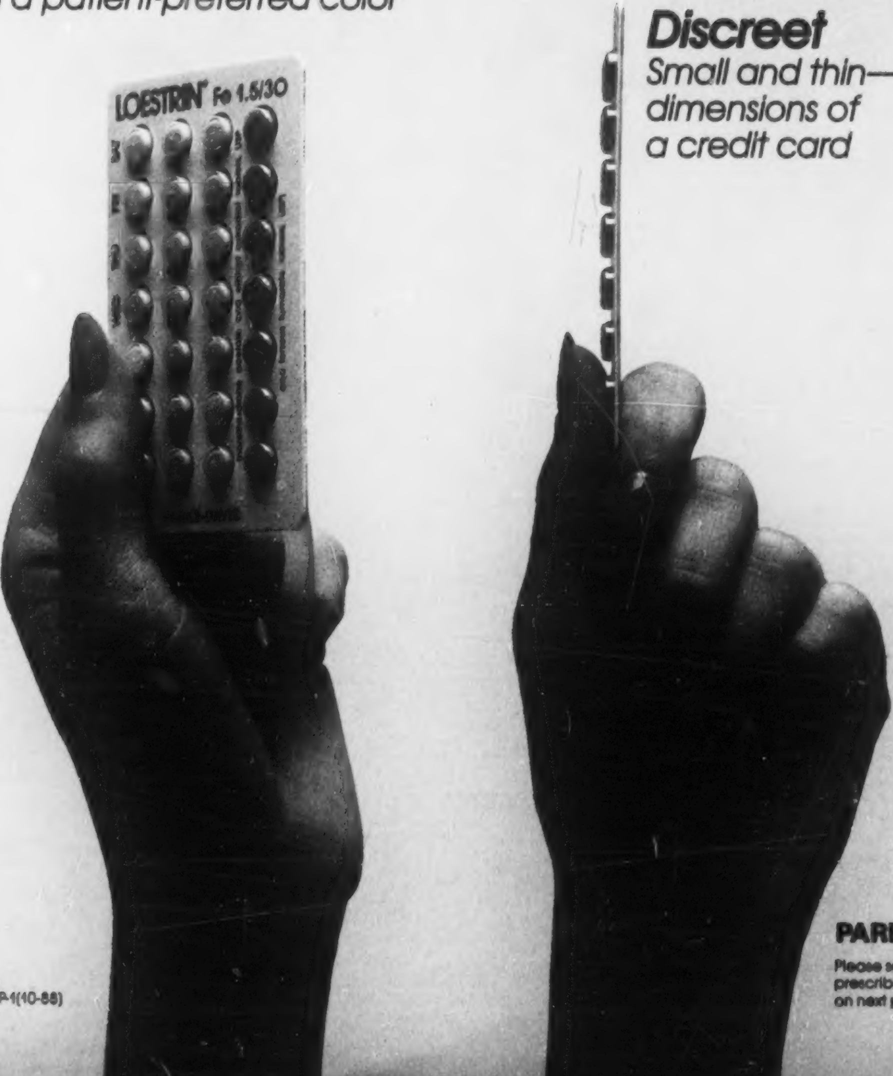
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LOESTRIN® Fe
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INDICATIONS AND USAGE: Loestrin 21 and Loestrin Fe are indicated for the prevention of pregnancy in women who elect to use oral contraceptives (OCs) as a method of contraception. **Dose-Related Risk of Thromboembolism from Oral Contraceptives:** Two studies have shown a positive association between the dose of estrogens in oral contraceptives and the risk of thromboembolism. For this reason, it is prudent and in keeping with good principles of therapeutics to minimize exposure to estrogen. The OC product prescribed for any given patient should be that product which contains the least amount of estrogen that is compatible with an acceptable pregnancy rate and patient acceptance. It is recommended that new acceptors of OCs be started on preparations containing 0.05 mg or less of estrogen. **CONTRAINDICATIONS:** OCs should not be used in women with any of the following conditions: 1. Thrombophlebitis or thromboembolic disorders. 2. A past history of deep vein thrombophlebitis or thromboembolic disorders. 3. Cerebral vascular or coronary artery disease. 4. Known or suspected carcinoma of the breast. 5. Known or suspected estrogen-dependent neoplasia. 6. Undiagnosed abnormal genital bleeding. 7. Known or suspected pregnancy (see Warning No. 5). 8. Benign or malignant liver tumor which developed during the use of oral contraceptives or other estrogen-containing products.

WARNINGS

> **Cigarette smoking increases the risk of serious cardiovascular side effects from oral contraceptive use. This risk increases with age and with heavy smoking (15 or more cigarettes per day) and is quite marked in women over 35 years of age. Women who use oral contraceptives should be strongly advised not to smoke.**
>
> The use of oral contraceptives is associated with increased risk of several serious conditions including thromboembolism, stroke, myocardial infarction, hepatic adenoma, gallbladder disease, and hypertension. Practitioners prescribing oral contraceptives should be familiar with the following information relating to these risks.

1. *Thromboembolic Disorders and Other Vascular Problems.* An increased risk of thromboembolic and thrombotic disease associated with the use of OCs is well established. Three principal studies in Great Britain and three in the United States have demonstrated an increased risk of fatal and nonfatal venous thromboembolism and stroke, both hemorrhagic and thrombotic. These studies estimate that users of OCs are 4 to 11 times more likely than nonusers to develop these diseases without evident cause. **Cerebrovascular Disorders:** In a collaborative American study of cerebrovascular disorders in women with and without predisposing causes, it was estimated that the risk of hemorrhagic stroke was 2.0 times greater in users than in nonusers and the risk of thrombotic stroke was 4 to 9.5 times greater in users than in nonusers. **Myocardial Infarction:** An increased risk of myocardial infarction associated with the use of OCs has been reported, confirming a previously suspected association. These studies, conducted in the United Kingdom, found, as expected, that the greater the number of underlying risk factors for coronary artery disease (cigarette smoking, hypertension, hypercholesterolemia, obesity, diabetes, history of preeclamptic toxemia), the higher the risk of developing myocardial infarction, regardless of whether the patient was an OC user or not. OCs, however, were found to be a clear additional risk factor. In terms of relative risk, it has been estimated that OC users who do not smoke (smoking is considered a major predisposing condition to myocardial infarction) are about twice as likely to have a fatal myocardial infarction as nonusers who do not smoke. OC users who are also smokers have about a 5-fold increased risk of fatal infarction compared to users who do not smoke, but about a 10- to 12-fold increased risk compared to nonusers who do not smoke. Furthermore, the amount of smoking is also an important factor. In determining the importance of these relative risks, however, the baseline rates for various age groups must be given serious consideration. The importance of other predisposing conditions mentioned above in determining relative and absolute risks has not as yet been quantified; it is quite likely that the same synergistic action exists, but perhaps to a lesser extent. **Risk of Dose:** In an analysis of data derived from several national adverse reaction reporting systems, British investigators concluded that the risk of thromboembolism, including coronary thrombosis, is directly related to the dose of estrogen used in oral contraceptives. Preparations containing 100 mcg or more of estrogen were associated with a higher risk of thromboembolism than those containing 50 to 80 mcg of estrogen. Their analysis did suggest, however, that the quantity of estrogen may not be the sole factor involved. This finding has been confirmed in the United States. Careful epidemiological studies to determine the degree of thromboembolic risk associated with progestogen-only OCs have not been performed. Cases of thromboembolic disease have been reported in women using these products, and they should not be presumed to be free of excess risk. **Persistence of Risk:** In confirmation of earlier reports, two studies have suggested that an increased risk may persist for as long as 6 years after discontinuation of oral contraceptive use for cerebrovascular disease and 9 years for myocardial infarction. In addition, a prospective study suggested the persistence of risk for subarachnoid hemorrhage. **Estimate of Excess Mortality from Circulatory Diseases:** A large prospective study carried out in the U.K. estimated the mortality rate per 100,000 women per year from diseases of the circulatory system for users and nonusers of OCs according to age, smoking habits, and duration of use. The overall excess death rate annually from circulatory diseases for OC users was estimated to be 20 per 100,000 (ages 15 to 34 – 5/100,000; ages 35 to 44 – 33/100,000; ages 45 to 49 – 140/100,000), the risk being concentrated in older women, in those with a long duration of use, and in cigarette smokers. It was not possible, however, to examine the interrelationships of age, smoking, and duration of use, nor to compare the effects of continuous versus intermittent use. Although the study showed a 10-fold increase in death due to circulatory diseases in users for 5 or more years, all of these deaths occurred in women 35 or older. Until larger numbers of women under 35 with continuous use for 5 or more years are available, it is not possible to assess the magnitude of the relative risk for this younger age group. The available data from a variety of sources have been analyzed to estimate the risk of death associated with various methods of contraception. The estimates of risk of death for each method include the combined risk of the contraceptive method (eg, thromboembolic and thrombotic disease in the case of oral contraceptives) plus the risk attributable to pregnancy or abortion in the event of method failure. This latter risk varies with the effectiveness of the contraceptive method. The study concluded that the mortality associated with all methods of birth control is low and below that associated with childbirth, with the exception of OCs in women over 40 who smoke. (The rates given for pill only/smokers for each age group are for smokers as a class. For "heavy" smokers [more than 15 cigarettes a day] the rates given would be about double; for "light" smokers [less than 15 cigarettes a day] about 50 percent.) The lowest mortality is associated with the condom or diaphragm backed up by early abortion. The risk of thromboembolic and thrombotic disease associated with OCs increases with age after approximately age 30 and, for myocardial infarction, is further increased by hypertension, hypercholesterolemia, obesity, diabetes, or history of preeclamptic toxemia and especially by cigarette smoking. The physician and the patient should be alert to the earliest manifestations of thromboembolic and thrombotic disorders (eg, thrombophlebitis, pulmonary embolism, cerebrovascular insufficiency, coronary occlusion, retinal thrombosis, and mesenteric thrombosis). Should any of these occur or be suspected, the drug should be discontinued immediately. A four- to six-fold increased risk of postsurgery thromboembolic complications has been reported in OC users. If feasible, OCs should be discontinued at least 4 weeks before surgery of a type associated with an increased risk of thromboembolism or prolonged immobilization. 2. *Ocular Lesions.* There have been reports of neuro-ocular lesions, such as optic neuritis or retinal thrombosis, associated with the use of OCs. Discontinue OC medication if there is unexplained, sudden or gradual, partial or complete loss of vision; onset of proptosis or diplopia; papilledema; or retinal vascular lesions, and institute appropriate diagnostic and therapeutic measures. 3. *Carcinoma.* Long-term continuous administration of either natural or synthetic estrogen in certain animal species increases the frequency of carcinoma of the breast, cervix, vagina, and liver. Certain synthetic progestogens, none currently contained in OCs, have been noted to increase the incidence of mammary nodules, benign and malignant, in dogs. In humans, three case control studies have reported an increased risk of endometrial carcinoma associated with the prolonged use of exogenous estrogen in postmenopausal women. One publication reported on the first 21 cases submitted by physicians to a registry of cases of adenocarcinoma of the endometrium in women under 40 on OCs. Of the cases found in women without predisposing risk factors for adenocarcinoma of the endometrium (eg, irregular bleeding at the time OCs were first given, polycystic ovaries), nearly all occurred in women who had used a sequential OC. These products are no longer marketed. No evidence has been reported suggesting an increased risk of endometrial cancer in users of conventional-combination or progestogen-only OCs. Several studies have found no increase in breast cancer in women taking OCs or estrogens. One study, however, while also noting no overall increased risk of breast cancer in women treated with OCs, found an excess risk in the subgroups of OC users with documented benign breast disease. A reduced occurrence of benign breast tumors in users of OCs has been well documented. In summary, there is at present no confirmed evidence from human studies of an increased risk of cancer associated with OCs. Close clinical surveillance of all women taking OCs is, nevertheless, essential. In all cases of undiagnosed persistent or recurrent abnormal vaginal bleeding, appropriate diagnostic measures should be taken to rule out malignancy. Women with a strong family history of breast cancer or who have breast nodules, fibrocystic disease, or abnormal mammograms should be monitored with particular care if they elect to use OCs instead of other methods of contraception. 4. *Hepatic Tumors.* Benign hepatic adenomas have been found to be associated with the use of OCs. One study showed that OC formulations with high hormonal potency were associated with a higher risk than lower potency formulations. Although benign, hepatic adenomas may rupture and may cause death through intra-abdominal hemorrhage. This has been reported in short-term as well as long-term users of OCs. Two studies relate risk with duration of use of the contraceptive, the risk being much greater after 4 or more years of OC use. While hepatic adenoma is a rare lesion, it should be considered in women presenting abdominal pain and tenderness, abdominal mass or shock. A few cases of hepatocellular carcinoma have been reported in women taking oral contraceptives. The relationship of these drugs to this type of malignancy is not known at this time. 5. *Use in or Immediately Preceding Pregnancy, Birth Defects in Offspring, and Malignancy in Female Offspring.* The use of female sex hormones – both estrogenic and progestational agents – during early pregnancy may seriously damage the offspring. It has been shown that females exposed *in utero* to diethylstilbestrol, a nonsteroidal estrogen, have an increased risk of developing in later life a form of vaginal or cervical cancer that is ordinarily extremely rare. This risk has been estimated to be of the order of 1 in 1,000 exposures or less. Although there is no evidence at the present time that OCs further enhance the risk of developing this type of malignancy, such patients should be monitored with particular care if they elect to use OCs instead of other methods of contraception. Furthermore, a high percentage of such exposed women (from 30% to 90%) have been found to have epithelial changes of the vagina and cervix. Although these changes are histologically benign, it is not known whether this condition is a precursor of vaginal malignancy. Male children so exposed may develop abnormalities of the urogenital tract. Although similar data are not available with the use of other estrogens, it cannot be presumed that they would not induce similar changes. An increased risk of congenital anomalies, including heart defects and limb defects, has been reported with the use of sex hormones, including OCs, in pregnancy. One case control study has estimated a 4.7-fold increase in risk of limb reduction defects in infants exposed *in utero* to sex hormones (OCs, hormonal withdrawal tests for pregnancy or attempted treatment for threatened abortion). Some of these exposures were very short and involved only a few days of treatment. The data suggest that the risk of limb-reduction defects in exposed fetuses is somewhat less than 1 in 1,000 live births. In the past, female sex hormones have been used during pregnancy in an attempt to treat threatened or habitual abortion. There is considerable evidence that estrogens are ineffective for these indications, and there is no evidence from well controlled studies that progestogens are effective for these uses. There is some evidence that triploidy and possibly other types of polyploidy are increased among abortuses from women who become pregnant soon after ceasing OCs. Embryos with these anomalies are virtually always aborted spontaneously. Whether there is an overall increase in spontaneous abortion of pregnancies conceived soon after stopping OCs is unknown. It is recommended that for any patient who has missed two consecutive periods, pregnancy should be ruled out before continuing the contraceptive regimen. If the patient has not adhered to the prescribed schedule, the possibility of pregnancy should be considered at the time of the first missed period, and further use of OCs should be withheld until pregnancy has been ruled out. If pregnancy is confirmed, the patient should be apprised of the potential risks to the fetus and the advisability of continuation of the pregnancy should be discussed in the light of these risks. It is also recommended that women who discontinue oral contraceptives with the intent of becoming pregnant use an alternate form of contraception for a period of time before attempting to conceive. Many clinicians recommend 3 months although no precise information is available on which to base this recommendation. The administration of progestogen-only or progestogen-estrogen combinations to induce withdrawal bleeding should not be used as a test of pregnancy. 6. *Gallbladder Disease.* Studies report an increased risk of surgically confirmed gallbladder disease in users of OCs and estrogens. In one study, an increased risk appeared after 2 years of use and doubled after 4 or 5 years of use. In one of the other studies, an increased risk was apparent between 6 and 12 months of use. 7. *Carbohydrate and Lipid Metabolic Effects.* A decrease in glucose tolerance has been observed in a significant percentage of patients on OCs. For this reason, prediabetic and diabetic patients should be carefully observed while receiving OCs. An increase in triglycerides and total phospholipids has been observed in patients receiving OCs. The clinical significance of this finding remains to be defined. 8. *Elevated Blood Pressure.* An increase in blood pressure has been reported in patients receiving OCs. In some women, hypertension may occur within a few months of beginning OC use. In the first year of use, the prevalence of women with hypertension is low in users and may be no higher than that of a comparable group of nonusers. The prevalence in users increases, however, with longer exposure, and in the fifth year of use is two and a half to three times the reported prevalence in the first year. Age is also strongly correlated with the development of hypertension in OC users. Women who previously have had hypertension during pregnancy may be more likely to develop elevation of blood pressure when given OCs. Hypertension that develops as a result of taking OCs usually returns to normal after discontinuing the drug. 9. *Headache.* The onset or exacerbation of migraine or development of headache of a new pattern which is recurrent, persistent, or severe, requires discontinuation of OCs and evaluation of the cause. 10. *Bleeding Irregularities.* Breakthrough bleeding, spotting, and amenorrhea are frequent reasons for patients discontinuing OCs. In breakthrough bleeding, as in all cases of irregular bleeding from the vagina, nonfunctional causes should be borne in mind. In undiagnosed persistent or recurrent abnormal bleeding from the vagina, adequate diagnostic measures are indicated to rule out pregnancy or malignancy. If pathology has been excluded, time or a change to another formulation may solve the problem. Changing to an OC with a higher estrogen content, while potentially useful in minimizing menstrual irregularity, should be done only if necessary since this may increase the risk of thromboembolic disease. Women with a past history of oligomenorrhea or secondary amenorrhea or young women without regular cycles may have a tendency to remain anovulatory or to become amenorrheic after discontinuation of OCs. Women with these preexisting problems should be advised of this possibility and encouraged to use other contraceptive methods. Post-use anovulation, possibly prolonged, may also occur in women without previous irregularities. 11. *Ectopic Pregnancy.* Ectopic as well as intrauterine pregnancy may occur in contraceptive failures. However, in progestogen-only OC failures, the ratio of ectopic to intrauterine pregnancies is higher than in women who are not receiving OCs, since the drugs are more effective in preventing intrauterine than ectopic pregnancies. 12. *Breast Feeding.* OCs given in the postpartum period may interfere with lactation. There may be a decrease in the quantity and quality of the breast milk. Furthermore, a small fraction of the hormonal agents in OCs has been identified in the milk of mothers receiving these drugs. The effects, if any, on the breast-fed child have not been determined. If feasible, the use of OCs should be deferred until the infant has been weaned. **PRECAUTIONS: General:** 1. A complete medical and family history should be taken prior to the initiation of OCs. The pretreatment and periodic physical examinations should include special reference to blood pressure, breasts, abdomen and pelvic organs, including Papanicolaou smear and relevant laboratory tests. As a general rule, OCs should not be prescribed for longer than 1 year without another physical examination being performed. 2. Under the influence of estrogen-progestogen preparations preexisting uterine leiomyomata may increase in size. 3. Patients with a history of psychic depression should be carefully observed and the drug discontinued if depression recurs to a serious degree. Patients becoming significantly depressed while taking OCs should stop the medication and use an alternate method of contraception in an attempt to determine whether the symptom is drug related. 4. OCs may cause some degree of fluid retention. They should be prescribed with caution, and only with careful monitoring, in patients with conditions which might be aggravated by fluid retention, such as convulsive disorders, migraine syndrome, asthma, or cardiac or renal insufficiency. 5. Patients with a past history of jaundice during pregnancy have an increased risk of recurrence of jaundice while receiving OC therapy. If jaundice develops in any patient receiving such drugs, the medication should be discontinued. 6. Steroid hormones may be poorly metabolized in patients with impaired liver function and should be administered with caution in such patients. 7. OC users may have disturbances in normal tryptophan metabolism which may result in a relative pyridoxine deficiency. The clinical significance of this is yet to be determined. 8. Serum folate levels may be depressed by OC therapy. Since the pregnant woman is predisposed to the development of folate deficiency and the incidence of folate deficiency increases with increasing gestation, it is possible that if a woman becomes pregnant shortly after stopping OCs, she may have a greater chance of developing folate deficiency and complications attributed to this deficiency. 9. The pathologist should be advised of OC therapy when relevant specimens are submitted. 10. Certain endocrine and liver function tests and blood components may be affected by estrogen-containing OCs: a. Increased sulfobromophthalein retention. b. Increased prothrombin and factors VII, VIII, IX, and X; decreased antithrombin 3; increased norepinephrine-induced platelet aggregability. c. Increased thyroid binding globulin (TBG) leading to increased circulating total thyroid hormone, as measured by protein-bound iodine (PBI), T4 by column, or T4 by radioimmunoassay. Free T3 resin uptake is decreased, reflecting the elevated TBG; free T4 concentration is unaltered. d. Decreased pregnanediol excretion. e. Reduced response to metyrapone test. **INFORMATION FOR THE PATIENT:** See Patient Labeling. **DRUG INTERACTIONS:** Reduced efficacy and increased incidence of breakthrough bleeding have been associated with concomitant use of rifampin. A similar association has been suggested with barbiturates, phenylbutazone, phenytoin sodium, tetracycline, and ampicillin. **CARCINOGENESIS, PREGNANCY, NURSING MOTHERS:** See Contraindications and Warnings sections.
ADVERSE REACTIONS: An increased risk of the following serious adverse reactions has been associated with the use of OCs (see Warnings): Thrombophlebitis; pulmonary embolism; coronary thrombosis; cerebral thrombosis; cerebral hemorrhage; hypertension; gallbladder disease; benign hepatomas; congenital anomalies. There is evidence of an association between the following conditions and the use of OCs, although additional confirmatory studies are needed: Mesenteric thrombosis; neuro-ocular lesions, eg, retinal thrombosis and optic neuritis. The following adverse reactions have been reported in patients receiving OCs and are believed to be drug related: Nausea and/or vomiting, usually the most common adverse reactions, occur in approximately 10 percent or less of patients during the first cycle. Other reactions, as a general rule, are seen much less frequently or only occasionally: Gastrointestinal symptoms (such as abdominal cramps and bloating); breakthrough bleeding; spotting; change in menstrual flow; dysmenorrhea; amenorrhea during and after treatment; temporary infertility after discontinuance of treatment; edema; chloasma or melasma which may persist; breast changes: tenderness, enlargement and secretion; change in weight (increase or decrease); change in cervical erosion and cervical secretion; possible diminution in lactation when given immediately postpartum; cholestatic jaundice; migraine; increase in size of uterine leiomyomata; rash (allergic); mental depression; reduced tolerance to carbohydrates; vaginal candidiasis; change in corneal curvature (steepening); intolerance to contact lenses. The following adverse reactions have been reported in users of OCs, and the association has been neither confirmed nor refuted: Premenstrual-like syndrome; cataracts; changes in libido; chorea; changes in appetite; cystitis-like syndrome; headache; nervousness; dizziness; hirsutism; loss of scalp hair; erythema multiforme; erythema nodosum; hemorrhagic eruption; vaginitis; porphyria; hemolytic uremic syndrome.
ACUTE OVERDOSE: Serious ill effects have not been reported following acute ingestion of large doses of OCs by young children. Overdosage may cause nausea, and withdrawal bleeding may occur in females. **HOW SUPPLIED:** Loestrin **21** 1/20 is available in dispensers each containing 21 tablets. Each tablet contains 1 mg of norethindrone acetate and 20 mcg of ethinyl estradiol. Available in packages of five dispensers. Loestrin **Fe** 1/20 is available in dispensers each containing 21 white tablets and 7 brown tablets. Each white tablet contains 1 mg of norethindrone acetate and 20 mcg of ethinyl estradiol. Each brown tablet contains 75 mg ferrous fumarate. Available in packages of five dispensers. Loestrin **21** 1.5/30 is available in dispensers each containing 21 tablets. Each tablet contains 1.5 mg of norethindrone acetate and 30 mcg of ethinyl estradiol. Available in packages of five dispensers. Loestrin **Fe** 1.5/30 is available in dispensers each containing 21 green tablets and 7 brown tablets. Each green tablet contains 1.5 mg of norethindrone acetate and 30 mcg of ethinyl estradiol. Each brown tablet contains 75 mg ferrous fumarate. Available in packages of five dispensers.
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Family Planning
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UPDATE

Pronatalist Policy's Bitter Fruit

By the time Romania's former president, Nicolae Ceausescu, was overthrown and executed in December 1989, he had established the most aggressively pronatalist population policy in the world and, according to recent reports, that very policy may have played a role in his downfall.[1] The campaign to increase Romania's population began in 1966, when the availability both of legal induced abortion and of contraceptives was severely restricted. Eventually, textbooks containing information on contraception were banned, and women of reproductive age were tested or examined every few months at the workplace for signs of pregnancy. The immediate result was a sharp rise in the number of births between 1967 and 1976, but an increase in reliance on illegal abortion and traditional means of birth control eventually reduced the birthrate to earlier levels. The long-term result was that maternal mortality rates in Romania far surpassed those of any other European country, with deaths related to illegal abortion representing 86 percent of all maternal deaths.[2] As a result, the abortion statute was the second law struck down on the new Romanian government's first day in power. Furthermore, the huge bulge in the number of people born between 1967 and 1976 reportedly played havoc with the government's central planning as it moved inexorably through the Romanian population pyramid. These were the very people—now in their teens and early 20s—who played a leading role in the street demonstrations that brought down Ceausescu.

1. D. Binder, "Where Fear and Death Went Forth and Multiplied," *New York Times,* Jan. 24, 1990, p. A12; C. Bohlen, "Rumanians Moving to Abolish Worst of Repressive Era: Capital Relatively Calm: Typewriter Registration and Use of 'Comrade' Ended—Abortion Legalized," *New York Times,* Dec. 28, 1989, p. A1; K. Breslau, "Overplanned Parenthood: Ceausescu's Cruel Law," *Newsweek,* Jan. 22, 1990, p. 35; and L. Y. Jones, Jr., "Busted by the Baby Boom," *Time,* Jan. 29, 1990, p. 36.
2. "The Impact of Unsafe Abortion in the Developing World," *Outlook,* Vol. 7, No. 3, Oct. 1989, p. 6.

In Sickness and in Health

A detailed multivariate analysis of Canadian vital statistics data confirms that married men and women have lower mortality rates than those who are unmarried.[1] Furthermore, married people's mortality advantage can be seen in the rates for both cardiovascular disease and malignancies. When regression equations were calculated separately for women and for men, the analysis revealed that men who marry appear to derive a greater health benefit than do women who marry. Only among remarried widows and widowers do women have a mortality advantage over men.

1. F. Trovato and G. Lauris, "Marital Status and Mortality in Canada: 1951–1981," *Journal of Marriage and theFamily,* **51**:907, 1989.

Something in the Semen?

A small North Carolina study offers tantalizing evidence that barrier contraceptive use may be linked to an excess risk of developing preeclampsia (elevated blood pressure and proteinuria or edema during pregnancy); the key factor appears to involve the woman's lifetime exposure to sperm or to seminal fluid.[1] A total of 110 women who had had preeclampsia during their most recent pregnancy were contrasted with another 115 who had been pregnant at around the same time. The former were more than twice as likely as the latter to have used barrier methods exclusively (20 percent vs. nine percent). Since all women were asked about frequency of intercourse and types of methods used in the past, the investigators were able to analyze the group by their estimated exposure to sperm in the past; the results indicated that women with the least exposure to semen had the highest risk of developing preeclampsia (an odds ratio of 2.4). They propose that exposure to antigens or some unknown agent in the semen may lower the risk of preeclampsia, but caution that more research, based on a larger sample, will be needed to confirm these findings.

1. H. S. Klonoff-Cohen et al., "An Epidemiologic Study of Contraception and Preeclampsia," *Journal of the American Medical Association,* **262**:3143, 1989

The Teenagers Who Never Return

Only about half of a group of 76 teenage oral contraceptive users recruited at the time of their visit to a family planning clinic actually returned to that clinic for their scheduled three-month follow-up visit.[1] All of the teenagers who returned to the clinic were still using the pill consistently. However, of those who did not return, only half could be contacted, even though arrangements had been made with the teenagers for telephone follow-up. All of those contacted had stopped using the pill, and these teenagers were more likely than continuing users both to have been concerned about the potential health-related problems of the pill and to have experienced a problem using the pill. Two-thirds of the teenage clinic patients who returned had called the clinic for advice if they experienced problems; in contrast, none of the teenagers who failed to return had called the clinic when problems began. "Increased teaching of adolescents by practitioners . . . to call the clinic should a side effect occur," the researchers conclude, "may enhance contraceptive continuation."

1. M. L. Balassone, "Risk of Contraceptive Discontinuation Among Adolescents," *Journal of Adolescent Health Care,* **10**:527, 1989.

Rx: Frequent Pap Smears

Women who have Pap smears more than two years apart are at elevated risk of developing invasive cervical cancer, according to a recent case-control study.[1] A comparison of 92 women with cervical cancer and 178 controls from the same area of the country revealed that women who had had Pap smears at three-year intervals over the preceding 10 years were more than twice as likely to have developed cervical cancer as were those who were screened annually, even when the analysis was controlled for risk factors such as age, number of sexual partners, age at first intercourse and level of education. Furthermore, those who had not had a Pap smear in the preceding 10 years were nearly seven times as likely to have developed cervical cancer. The investigators also point out that "the number of cases of invasive cervical cancer attributable to . . . screening intervals of three or more years was significantly greater for women with multiple lifetime sexual partners and women with early age at first intercourse. . . . Women with either of these risk factors should be particularly encouraged to comply with [Pap] smear screening recommendations."

1. K. Shy et al., "Papanicolaou Smear Screening Interval and Risk of Cervical Cancer," *Obstetrics & Gynecology*, **74**:838, 1989.

Cervical Dilatation by Osmosis

A small-scale study of first-trimester abortion patients shows that an osmotic dilator is more consistently effective than a vaginal prostaglandin suppository at dilating the cervix, and produces more uniform dilatation as well.[1] (The osmotic dilator, a sponge containing magnesium salts, absorbs water from the cervix and causes it to relax gradually.) Although the osmotic dilator induces slightly greater blood loss than does the suppository, it causes less pain during dilatation, and women using it need less pain-relieving medication. The investigators conclude that while both techniques are effective, the osmotic dilator is "clearly the superior method."

1. U. Jürgensen and N. J. Christensen, "Cervagem®/Dilapan® for Preoperative Cervical Dilatation Prior to Vacuum Aspiration for Termination of First Trimester Pregnancy: A Prospective Randomized Study," *Contraception*, **40**:741, 1989.

Maternal HIV Transmission: A Clue?

Infants born prematurely to a group of Brooklyn women infected with the human immunodeficiency virus (HIV) were far more likely to become HIV-infected themselves than were those born close to or at term (60 percent vs. 22 percent).[1] Among full-term infants, investigators discovered that 53 percent born to women with a low level of immune reaction to a protein found in the envelope of the virus developed HIV infection, compared with none of those born to women with medium resistance to the protein and seven percent of those born to women with high resistance. No such association was seen among infants born prematurely, however. They note that the antibody to the protein may afford infants some protection against HIV infection during the last trimester of pregnancy and that "approaches to maximize the likelihood of full-term delivery" may help reduce the number of infants who will be infected with HIV.

1. J. J. Goedert et al., "Mother-to-Infant Transmission of Human Immunodeficiency Virus Type 1: Association with Prematurity or Low Anti-gp120," *Lancet*, **II**:1351, 1989.

The Pill, Smoking and Carotene

Circulating levels of ß-carotene, a micronutrient that may play a role in inhibiting the development of some tumors, appear to be significantly reduced among oral contraceptive users.[1] An analysis of vitamin levels among 149 family planning clinic clients showed that pill users' ß-carotene concentrations were significantly lower ($p<0.001$) than those of other women. On the other hand, plasma levels of another vitamin, retinol, were significantly greater ($p<0.001$) among pill users than among other women. The results also revealed that smokers had significantly lower levels of ß-carotene than nonsmokers, and that the lowest levels were found among pill users who smoked. The investigators conclude that prospective studies will be needed to demonstrate conclusively whether pill use is a direct cause of this vitamin's depletion.

1. P. R. Palan, "Effects of Smoking and Oral Contraception on Plasma ß-Carotene Levels in Healthy Women," *American Journal of Obstetrics and Gynecology*, **161**:881, 1989.

Dispute on Cervical Cap Regulations

When the cervical cap was approved by the U.S. Food and Drug Administration (FDA) in 1989, concern over purported cervical cell abnormalities in some users led the FDA to recommend that women using the cap have Pap smears after three months of use. Now, however, two analyses indicate that such a precaution may be unnecessary. A study of more than 3,000 cap users revealed no excess risk of cytological changes among women using the cap,[1] while a reanalysis[2] of the data the FDA relied on to approve the device contradicted the original study's finding that cap users were at an increased risk of developing cervical abnormalities. The authors of the latter study concluded that "the requirement of a three-month Pap smear [not only is] economically burdensome to potential users of the cap, but appears to be without firm foundation in the original data or in our current views of cervical carcinogenesis." It is likely that the manufacturer of the cervical cap will petition the FDA to drop the three-month Pap smear recommendation on the basis of these studies.[3]

1. G. A. Richwald et al., "Effectiveness of the Cavity-Rim Cervical Cap: Results of a Large Clinical Study," *Obstetrics & Gynecology*, **74**:143, 1989.
2. E. L. Gollub and I. Sivin, "The Prentif Cervical Cap and Pap Smear Results: A Critical Appraisal," *Contraception*, **40**:343, 1989.
3. "Data Challenge Three-Month Pap Smear Requirement for Cap Users," *Contraceptive Technology Update*, **10**:156, 1989

A Focal Point of HIV Infection

In 1985, a Belgian woman was diagnosed as having AIDS-related complex. As part of a Belgian partner notification program begun in that year, she identified an African civil engineer as the only possible source of the infection. When he was diagnosed as infected with HIV as well, he gave health authorities the names of 19 women with whom he had had intercourse over the preceding five years; 11 of the 18 women who agreed to be tested had developed an HIV infection.[1] The women had no high-risk characteristics, and two of them became infected after only one act of intercourse with the man. Those who had had intercourse with him in the two years before the infection was detected were more likely than the others to have become infected. The researchers conclude that "emphasizing only sexual relations with multiple partners as a risk factor for women may be irrelevant and even counterproductive, since it implies that the absence of multiple partners makes women 'safe,' " when in fact the risk from ongoing contact with one partner who is at risk for HIV may be higher than that from contact with multiple partners.

1. N. Clumeck et al., "A Cluster of HIV Infection Among Heterosexual People Without Apparent Risk Factors," *New England Journal of Medicine*, **321**:1460, 1989.

Public-Sector Savings Resulting from Expenditures For Contraceptive Services

By Jacqueline Darroch Forrest and Susheela Singh

Summary

Almost one in four U.S. women who use a reversible method of contraception rely on a publicly funded source of care, either a family planning clinic or a private physician reimbursed by Medicaid. According to three scenarios of alternative contraceptive use patterns, if publicly funded services were not available, these women would have between 1.2 million and 2.1 million unintended pregnancies over one year—substantially more than the approximately 400,000 they currently experience.If these women relying on publicly funded services were using no method of contraception, they would be expected to have more than 3.5 million unintended pregnancies in one year.

In FY 1987, federal and state governments spent $412 million on contraceptive services for women who otherwise might not have been able to obtain them. If these services had not been available, the additional public costs for medical care, welfare and supplementary nutritional programs during the first two years after a birth or for publicly funded abortions would have totaled $1.2–$2.6 billion. These savings represent an average of $4.40 saved for every dollar of public funds spent to provide contraceptive services.

"For every government dollar spent on family planning services, from $2.90 to $6.20 (an average of $4.40) is saved as a result of averting [short-term] expenditures on medical services, welfare and nutritional services."

Introduction

Since the late 1960s, the U.S. government and most states have subsidized contraceptive services for women who otherwise might not be able to afford such care, both through family planning clinics and through private physicians. However, public-sector spending for contraceptive services (in constant dollars) actually declined between FY 1980 and FY 1987.[1] Political conflict about family planning services has meant continual battles over the existence of such services and the form they should take, as well as over levels of program funding.[2] In 1989, the governor of California, George Deukmejian, cut state funding to family planning clinics by two-thirds,* saying he did not believe the services had saved the state any money.[3]

Is money being saved through such expenditures? If so, how much? There are no simple or certain answers, primarily because the savings come from events—both pregnancies and expenditures—that have been averted by contraceptive use. Finding answers to such questions requires estimates of how many women would have become pregnant if money had not been spent on family planning and of how much money would have been required to provide them with needed services.

National estimates of the savings resulting from public-sector expenditures for family planning services were first made for the period 1969–1974, when Frederick Jaffe and Phillips Cutright estimated that for every federal dollar appropriated for family planning clinic programs, $1.80 was saved. These savings resulted both from decreases in federal, state and local expenditures for medical care associated with pregnancy and childbirth and from reductions in expenditures that would have occurred over one year's time for medical care of the infant and for Aid to Families with Dependent Children (AFDC), social services, food stamps, other food programs and public housing for those family planning clinic patients on welfare.[4] A later study by Mary Chamie and Stanley Henshaw estimated that $1.98 in government expenditures was saved for every dollar spent by federal and state governments in 1979 to finance family planning clinic services.[5] These savings included medical costs related to childbirth and one-year costs of pediatric care, AFDC, social services, food subsidies and public housing expenditures for clinic patients currently receiving AFDC and for those who would have received it had they had a child.

As valuable as these estimates were, they are now quite old. The analysis by Jaffe and Cutright was based on estimates of births averted among clinic patients enrolled in 1969.[6] The study by Chamie and Henshaw used updated measures of program impact for adolescents enrolled as clinic patients in 1975, but relied on the Cutright-Jaffe data from 1969 for older women.[7] The utility of these estimates was also restricted by data limitations. For example, no information was available on the number of women receiving contraceptive care from private physicians through Medicaid. Consequently, the researchers attempted to limit their estimates to clinic services and expenditures, even though they did not know what proportion of total expenditures went to family

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*On January 31, 1990, Governor Deukmejian allowed a bill restoring much of this funding to become law without his signature after it had received overwhelming support in both houses of the California legislature. (See: G. Skelton, "Deukmejian Lets Family Planning Bill Become Law," *Los Angeles Times*, Feb. 1, 1990, p. A1.)

planning clinics. Jaffe and Cutright tried to deal with this limitation by excluding Medicaid expenditures for family planning from their estimate of the cost of family planning clinic services,[8] while Chamie and Henshaw excluded half of the total Medicaid funds spent for contraceptive services, on the assumption that this amount had been paid to private physicians rather than to clinics.[9]

The estimates of births averted used in both studies came from areal analyses that measured differences in birthrates across areas of the country (specifically, counties or groups of counties). Such analyses are limited to the information available for these geographic areas.*[10] In addition, they cannot identify whether births had been intended or unintended or which births occurred to women relying on family planning clinics. Further limitations result from there being no national data on the number of abortions by county of residence; state data are often missing also, as are area-specific data on contraceptive care from private physicians, on the extent of contraceptive use overall and on the levels of sexual activity.[11]

The potential confounding effects on the research results of having to ignore such variables or of having to estimate them indirectly have increased over time as a result of social changes. For instance, sexual activity among unmarried women has increased: Between 1971 and 1982, the proportion of never-married women aged 15–19 who had ever had intercourse rose from 28 percent to 41 percent.[12] In addition, contraceptive services and use have become more widespread: In 1968, 39 percent of U.S. counties had at least one family planning clinic, compared with 76 percent in 1983;[13] in 1971, 50 percent of never-married, sexually active women aged 15–19 living in metropolitan areas had practiced contraception at most recent intercourse, while by 1979, 70 percent had done so.[14] The proportion of currently married women aged 15–44 exposed to the risk of unintended pregnancy who were using contraceptives rose from 89 percent to 93 percent between 1973 and 1982.[15] Medicaid expenditures for contraceptive services have also increased substantially over time, from 19 percent of all public expenditures for family planning services in FY 1977 to 33 percent in FY 1987.[16]

This article provides current national estimates of the savings that result from public-sector expenditures for family planning services. More recent measures of variables on which the earlier estimates were based are now available (such as information on the costs of medical and social service care), as are actual measures of variables that had previously been inadequately measured or that were completely missing from the earlier analyses. For example, while prior analyses relied on aggregate estimates of Medicaid enrollment among family planning patients, each woman's Medicaid enrollment status can now be determined directly, and a woman's probable Medicaid status if she were to have a child can be estimated from information about her income and family size; data are also available for the first time on the number and characteristics of women on Medicaid who obtain publicly funded care from private physicians.

In addition, the changes in many variables (including levels of sexual activity, contraceptive use and the availability of publicly funded contraceptive services) since the earlier estimates raise questions about the applicability of the previous methodology and the assumptions upon which it was based. The new methodology used in this article allows savings to be estimated directly, by applying contraceptive failure rates, distributions of pregnancy outcomes and the public-sector costs to the actual numbers of publicly funded contraceptive users.

Methodology

The approach used here has four major steps: determining the number and characteristics of women using reversible contraceptives obtained from publicly supported contraceptive providers; estimating the number of unintended births, abortions and miscarriages they would experience under conditions of continued access to publicly funded services and under four scenarios of possible behavior should such services be discontinued; calculating the public-sector costs of medical care and social services for women who would be eligible for such services if they had a birth or abortion; and computing the savings in public spending resulting from expenditures on contraceptive services.

- *Identifying contraceptive users relying on publicly supported services.* We relied on data from Cycle III of the National Survey of Family Growth (NSFG) to identify the number and characteristics of women using reversible contraceptives in 1982 who had recently made a family planning visit to a publicly funded provider. In the NSFG, a representative sample of 7,969 U.S. women aged 15–44 were interviewed between August 1982 and February 1983.[17] (The results of Cycle IV, fielded in 1988, could not be used because at the time this study was conducted, the data tape had not yet been released.)

The respondents were divided into categories for which specific probabilities of unintended pregnancy and distributions of the outcome of unintended pregnancy are available: method used, age (by five-year age-groups), race (white or nonwhite), marital status (married or not married) and poverty status (<200 percent of poverty level† or ≥200 percent of poverty level). We also classified the women according to their family income, family size and Medicaid enrollment status, their risk of unintended pregnancy (whether or not they were sexually active, able to become pregnant and not wanting to become pregnant) and the source from which they had obtained contraceptive services.

NSFG respondents were considered users of publicly funded services if their most recent family planning visit within the 12 months preceding the interview was to a clinic or if they were a Medicaid enrollee and had made a family planning visit to a private physician within the preceding year. For purposes of the analysis, it was assumed that all clinics receive funding from public sources (98 percent of family planning agencies did so in 1983)[18] and that private physician visits made by women enrolled in Medicaid were paid for by Medicaid. If a Medicaid recipient had visited both a clinic and a private physician for family planning services within the preceding year, only her most recent source of care was taken into account.

Some women were enrolled in Medicaid at the time of their NSFG interview; others would become eligible for publicly funded care if they became pregnant and had a baby, because their poverty status would be lower and they would have a dependent child. Therefore, we estimated what each NSFG respondent's poverty status would be if her family size were one

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*This limitation applies to other areal analyses as well, such as J. D. Forrest, A. I. Hermalin and S. K. Henshaw, 1981 (see reference 11); S. Singh, "Adolescent Pregnancy in the United States: An Interstate Analysis," *Family Planning Perspectives*, **18**:211, 1986; J. A. Olsen and S. E. Weed, "Effects of Family-Planning Programs for Teenagers on Adolescent Birth and Pregnancy Rates," *Family Perspective*, **20**:153, 1986; and J. E. Anderson and L. G. Cope, 1987 (see reference 11).

†In 1982, 100 percent of poverty level was equivalent to an annual income of $6,281 for a family of two. Therefore, a family of two with an annual income twice this level, $12,562, was classified as at 200 percent of poverty. (See: U.S. Bureau of the Census, "Money Income and Poverty Status of Families and Persons in the U.S., 1982," *Current Population Reports*, Series P–60, No. 140, Washington, D.C., 1983.)

greater in number but her family income remained the same. The poverty-status ceiling for Medicaid eligibility varies by state. By weighting the state eligibility levels by the number of births in each state,[19] we calculated a weighted average ceiling for Medicaid eligibility in 1983 of 52 percent of poverty level. Although some women officially eligible for Medicaid do not enroll in the program, many who become pregnant are enrolled by providers of prenatal and delivery services, since this is the only way these providers will receive payment. We assumed that all who were not already enrolled in Medicaid but would meet the eligibility criteria of being below 53 percent of poverty level if they were to become pregnant and have a child would become enrolled.

By July 1989, Medicaid reimbursement for pregnancy-related and infant care was available to women up to a national average of 137 percent of poverty level.[20] The additional NSFG respondents who would have been eligible for Medicaid reimbursement for maternity and infant care on the basis of the expanded eligibility (i.e., those whose poverty status would be between 53 and 137 percent of poverty level if they were to become pregnant and have a baby) were therefore also identified.

• *Calculating the number of births, abortions and miscarriages.* We estimated the number of women using a reversible contraceptive method who would experience an accidental pregnancy within the next year, by using newly available data on the proportion of American women who become accidentally pregnant within one year of beginning an interval of contraceptive use.[21] These proportions differ for each method, vary by the characteristics of the user and reflect only the probability that a woman will become pregnant unintentionally despite using a contraceptive method. No distinction was made between unintended pregnancies among women who wanted to have a baby at some later date and those among women who did not want to have any more children at all. We assumed that women of similar characteristics would experience the same unintended pregnancy rates, regardless of where they had obtained services.[22]

Seventy-three percent of women using reversible methods and classified as relying on public-sector providers used oral contraceptives or the IUD, while 12 percent used the diaphragm; another nine percent used condoms, and seven percent used other methods. It is impossible to predict exactly what these women would do if publicly funded contraceptive services were not available.* Therefore, we present a range of possibilities, showing the implications of four alternative patterns of behavior. Each of the behavior patterns described here assumes that differing proportions of women would continue their current contraceptive methods, switch to other methods, use no method at all while remaining at risk of unintended pregnancy or no longer be at risk, because they either cease having intercourse or decide they want to have a baby.† Patterns I–III are based on the actual behavior of women in somewhat similar situations. Pattern IV assumes that, in the absence of publicly funded services, none of the women would practice contraception and all would remain at risk of unintended pregnancy; although not a very realistic scenario, it reflects the total impact of contraceptive use on the number of unintended pregnancies experienced by women using publicly funded providers.

Pattern I, based on the contraceptive behavior of women at risk of unintended pregnancy who are not using publicly funded providers, is estimated from NSFG data, with an adjustment to take into account that those who rely on publicly funded providers are generally poorer than those who do not. To make this adjustment, we assumed that the women using publicly funded providers would have the method distribution characteristic of women of similar poverty-level status who did not use a publicly subsidized provider. The resulting calculations show that 47 percent of women would be using the pill, the IUD or the diaphragm, 21 percent would be using no method of contraception and 16 percent each would be using the condom or other nonprescription methods. As can be seen in Table 1, to obtain such a distribution among women who have been relying on publicly funded services, 56 percent would have to continue to use their current method, 21 percent of women would use no method, 11 percent would switch from the pill, the IUD or the diaphragm to the condom and 12 percent would switch to other nonprescription methods.‡

Pattern II is based on the reported age-specific behavior patterns of all NSFG respondents who stopped using the pill between 1979 and the 1982 survey.[23] This pattern was selected as appropriate because a high proportion of public clients are pill users. According to this pattern, if public funding of family planning services were eliminated, 20 percent of women who discontinue would be at no immediate risk of unintended pregnancy, 28 percent of

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*To a large extent, whether women would be able to obtain care elsewhere probably depends on the costs of using private physicians and buying contraceptive supplies compared with the costs of obtaining such care from publicly funded providers. The fees for publicly funded contraceptive services are very low: Women enrolled in Medicaid pay no fee for visits to a clinic or a private physician; the provider is reimbursed directly by Medicaid for services rendered. In 1983, 67 percent of women receiving contraceptive services from family planning clinics were served for free, and those who were charged generally paid a very small fee. Women visiting Title X–funded clinics were served at no charge if their family income was below the federal poverty level, while those with an income at 125 percent of poverty were charged a median fee of $15 for an initial medical visit and a three-month supply of pills. In comparison, women going to non–Title X family planning clinics were charged a median fee of $14 for an initial visit and a supply of pills if their income was no more than 75 percent of poverty, or $23 if their income was 125 percent of poverty (see: reference 18). The estimated average first-year costs in the United States in 1982 for medical care and supplies for *nonsubsidized* family planning services, on the other hand, were $172 for oral contraceptives, $160 for the diaphragm and $131 for an IUD. The cost of purchasing a one-year supply of contraceptive foam was $50, and that of a one-year supply of condoms was $30 (see: A. Torres and J. D. Forrest, "The Costs of Contraception," *Family Planning Perspectives,* **15**:70, 1983). In the same year, the average cost for female sterilization was $1,300, and the average fee for a vasectomy performed in a physician's office was $240 (see: M. T. Orr et al., "The Provision of Sterilization Services by Private Physicians," *Family Planning Perspectives,* 17:216, 1985).

†All assume that no women would switch to contraceptive sterilization, for three reasons. First, the public funding currently available for sterilization is part of total allocations for family planning services, not a separate program, so if public funding for reversible contraceptive services were to become unavailable, it is unlikely that funding would still be available for sterilization. Furthermore, the women who rely on publicly funded providers for reversible contraceptives have chosen not to use a permanent method, generally because they are young and unmarried; thus, sterilization is probably not an appropriate choice for most of them. Finally, the cost to the patient of privately paid sterilization is many times greater than that of publicly or privately funded reversible contraception; it is unlikely that women relying on publicly funded providers would be able to pay for sterilization on their own.

‡Since 85 percent of all public-sector clients now rely on the pill, the IUD or the diaphragm, 56 percent of those users would have to continue using their current method if 47 percent were to be using the pill, IUD or diaphragm in the absence of federal subsidy (0.47/0.85 = 0.56). If 56 percent of all users continue using their current method, five percent (nine percent x 56 percent) of all women would continue to use the condom and four percent (seven percent x 56 percent) would continue to use other methods. To yield the 16 percent each using the condom or other nonprescription methods, an additional 11 percent would have to switch from the pill, the IUD or the diaphragm to the condom and another 12 percent would have to switch to other nonprescription methods.

Table 1. Percentage distribution of women, by contraceptive use and risk of unintended pregnancy if public funding of family planning services were unavailable, according to four patterns of use

Use and risk status	Pattern			
	I	II	III	IV
Continue method use				
Use current method	56	0	45	0
Switch to condom	11	24	0	0
Switch to other method	12	28	0	0
Discontinue method use				
At risk	21	28	55	100
Not at risk	0	20	0	0
Total	100	100	100	100

such women would be at risk but not using contraceptives and 52 percent would switch to another method. Among NSFG respondents who switched to a nonprescription method, 46 percent used the condom and 54 percent switched to another method. We assumed that if publicly funded services were unavailable, women switching to another method would choose the condom or other nonprescription methods in similar proportions. Thus, 24 percent would use condoms (46 percent of 52 percent) and 28 percent would use other methods (54 percent of 52 percent).

Pattern III is based on information from 1979 about the contraceptive methods used by new family planning clinic patients before their first visit.[24] The pattern indicates that 55 percent of those currently relying on publicly funded providers would use no method, while 45 percent would continue using their current method.*

Pattern IV illustrates a scenario in which none of the women affected would use contraceptives, but all would remain sexually active and at risk of unintended pregnancy. A comparison of the results from this pattern with those from the current pattern of contraceptive use illustrates the total contribution of method use to averting unintended pregnancies among those women using publicly funded providers.

We calculated the number of unintended pregnancies that would occur within a year under continued access to publicly funded contraceptive care and under Patterns I–IV by multiplying the number of women using each contraceptive method by the probability that they would become unintentionally pregnant within a year. Recent estimates by Elise Jones and Jacqueline Darroch Forrest of the percentage of women who become unintentionally pregnant within the first 12 months of beginning an interval of contraceptive use show that, in general, pregnancy rates are higher among women using barrier methods and young, unmarried and nonwhite users, and are roughly two-thirds higher among women under 200 percent of poverty than among higher income women.[25] The rates applied here take these characteristics into account by using unpublished calculations of the associated pregnancy rates for the pill, condom, diaphragm, periodic abstinence and other methods† (primarily spermicides) for subgroups by age (<20, 20–24 and 25–44), race (white or nonwhite), marital status (married or not married) and poverty status (<200 percent or ≥200 percent of poverty).

However, some of the women would have been using their method for more than one year, and failure rates usually decline with increasing duration of use (although data on the risk of pregnancy *after* the first year of use are not available). Thus, we adjusted for the expected lower levels of contraceptive failure among longer term users by making two assumptions: that half of all women using each method had begun doing so more than 12 months before, and that use-failure rates for all intervals longer than 12 months are only 75 percent of what they are for the first 12 months. We therefore decreased each of the subgroup-specific 12-month failure rates to 87.5 percent of the 12-month level (see Appendix, page 14).

In calculating the number of unintended pregnancies that would occur under the alternative patterns, we assumed that those who would switch to the condom or other nonprescription methods would have the same distribution by age, race, marital status and poverty status as all women using reversible methods and relying on publicly funded providers. We also assumed that those who would remain at risk of unintended pregnancy but use no contraceptive method if publicly funded care were unavailable would experience a pregnancy rate of 78 percent—87.5 percent of a recently estimated rate of 89 pregnancies per 100 nonusers.[26]

We next used national information on the outcome of unintended pregnancies to estimate how many of these unintended pregnancies would result in births, abortions or miscarriages.[27] In 1985, an estimated 41 percent of all unintended pregnancies ended as live births, 47 percent as abortions and the remainder as miscarriages or stillbirths (Table 2). The proportion that ended in births varied between 42 and 45 percent for women aged 15–34, and decreased to 38 percent among women 35–39 and to 17 percent among those aged 40–44. These age-specific proportions were applied to the numbers of unintended pregnancies estimated to occur under conditions of continued public funding and under alternative Patterns I–IV.

Table 2. Percentage distribution of unintended pregnancies, by age, according to type of outcome, 1985

Age	Birth	Abortion	Miscarriage/ stillbirth	Total
Total	**40.5**	**46.8**	**12.7**	**100.0**
15–19	41.7	45.4	12.9	100.0
20–24	44.8	42.0	13.2	100.0
25–29	43.5	43.5	13.0	100.0
30–34	45.0	41.8	13.2	100.0
35–39	38.0	49.5	12.5	100.0
40–44	17.3	72.0	10.7	100.0

Source: Calculated from reference 27.

- *Estimating the public-sector costs.* All federal and state expenditures for reversible contraceptive services are included in the analysis. Since the NSFG respondents reported family planning visits made within the 12 months before the survey (i.e., between August 1981 and February 1983, depending on the date of interview), we used expenditures during FY 1982 (October 1981–September 1982) to measure the total 12-month funding during the time the visits were made.[28] Information on public expenditures for family planning services comes from periodic surveys by The Alan Guttmacher Institute of state officials and periodic reviews of federal family planning grants under Title X of the Public Health Service Act. Expenditures for sterilizations, biomedical and social research, training and information, counseling and referral services that were not provided as part of medical contraceptive services and for abortion services have been excluded wherever possible.

Public-sector expenses for medical care during pregnancy and birth, and expenses for two years after birth for infant and pediatric care, food stamps and WIC payments are based on calcuations of public-sector costs of these services in 1985 made

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*Our assumption that 55 percent of women currently relying on publicly funded providers would use no method is probably a conservative one, given that the proportion of new patients who had been using no method prior to clinic enrollment increased from 31 percent in the mid-1970s to 46 percent in 1978 and 55 percent in 1979. More recent data are not available. The assumption that 45 percent would continue to use their current methods yields a distribution similar to the 1979 data, with 38 percent using prescription methods (85 percent of 45 percent) and seven percent using nonprescription methods (15 percent of 45 percent).

†Since use-failure rates for the IUD were not computed, in this analysis IUD users have been assigned the use-failure rates of pill users.

Table 3. Number of women (in millions) using reversible contraceptives and percentage distribution by most recent type of provider in last year, according to method used, poverty status and Medicaid enrollment status, 1982

Characteristic	No. of users	Funding and provider type					
		Publicly funded			Privately funded MD visit	No visit	Total
		Total	Clinic	MD			
Total	**19.8**	**22.9**	**20.5**	**2.4**	**43.5**	**33.7**	**100.0**
Method							
Pill or IUD	10.6	31.0	27.5	3.5	54.9	14.1	100.0
Diaphragm	2.4	22.0	19.8	2.2	50.0	28.1	100.0
Condom	3.6	11.0	10.6	0.4	26.0	62.9	100.0
Periodic abstinence	1.2	7.4	5.8	1.6	24.2	68.4	100.0
Other	2.1	11.1	10.7	0.4	26.0	62.9	100.0
Poverty status (percent)							
<100	2.6	53.0	42.9	10.1	21.7	25.3	100.0
100–149	2.1	29.6	27.2	2.4	42.9	27.6	100.0
150–199	2.3	26.3	24.5	1.8	37.8	35.8	100.0
≥200	12.9	15.1	14.2	0.9	49.0	35.9	100.0
Medicaid status							
Enrolled	1.4	77.6	44.3	33.3	0.0	22.5	100.0
Not enrolled	18.4	18.7	18.7	0.0	46.8	34.5	100.0

Source: Tabulations from the 1982 National Survey of Family Growth.

by Aida Torres and colleagues.[29] The estimates presented here exclude the costs of public housing, infant care, foster care or other social services. No costs were attributed to miscarriages, although some women who miscarry need medical attention and hospitalization. We also have not attempted to estimate expenditures after the first two years of the infant's life, although it has been shown that longer term expenditures for special education and services for disabled children add substantially to the public-sector costs of births to women relying on publicly funded contraceptive providers.[30]

We estimate that for a woman already enrolled in Medicaid, expenses for medical care for pregnancy and childbirth, infant and pediatric care, additional AFDC payments and food stamps, plus expenditures for the Special Supplemental Food Program for Women, Infants and Children (WIC), total $5,248 per birth and $186 per abortion (see Appendix, page 14). The average costs for each birth to a woman newly eligible for Medicaid would be higher ($8,493), because the costs of a new AFDC household are greater than the additional payment made when a new person is added to an existing AFDC household, and food stamp payments for someone newly on welfare are also higher than for someone already enrolled.

Under the expanded Medicaid coverage that existed in 1989, a larger number of women would become newly eligible for publicly funded pregnancy-related care and infant and pediatric care than was the case in 1982. A total of $3,675 would be spent on medical expenses for each birth to a woman newly eligible under the expanded criteria, less than for births to women enrolled under 1982 criteria because they would not be eligible for AFDC, food stamps or WIC payments.

• *Estimating public-sector savings.* Public-sector savings represent services that would have been paid for if a pregnancy had not been averted. We computed the total number of dollars spent on care for women with unintended pregnancies under conditions of current use and under alternative Patterns I–IV by applying the costs per birth to the numbers of births. These costs depended on whether the woman was already enrolled in Medicaid or whether she would become eligible if she had a baby. Likewise, we multiplied the average public-sector cost per abortion by the number of abortions expected to occur among Medicaid enrollees.

The total amount of money that would be spent under each of the four alternative patterns was greater than the amount we estimated would be needed if women had continued access to publicly funded care. The difference in each case represents the savings resulting from women's access to publicly funded care. We have also calculated the ratio between the total number of dollars saved and the amount of money that was spent on contraceptive services. These ratios are expressed in terms of the amount of money saved per dollar spent.

The first estimates presented are for the early 1980s, since the basic data used to estimate the number of unintended pregnancies averted come from the 1982 NSFG, the data on the costs of care are for 1983 and the data on contraceptive expenditures are for 1982. Because the number of women eligible for publicly funded medical care related to pregnancy and for medical care for infants and young children has grown significantly since the early 1980s, we estimated the levels of savings and the savings per dollar spent for the late 1980s as well, calculating savings-per-dollar ratios for the early 1980s as if eligibility for medical care had been as broad then as it was by 1989. These ratios were assumed to be closest to the current savings per dollar, and the total dollar amounts currently saved were estimated by multiplying these ratios by the dollars spent for contraceptive services in FY 1987, the latest year for which data on expenditures are available.

Findings

In 1982, a total of 19.8 million women aged 15–44 were using reversible methods of contraception (Table 3). Of these, 23 percent (4.5 million) obtained contraceptive care from publicly funded sources, some 21 percent from a family planning clinic and another two percent from a private physician through Medicaid. (Thus, about 4.1 million women relying on a reversible method had used a family planning clinic.*) More than three-quarters of all users of reversible contraceptives did not rely on publicly funded sources, with 44 percent having visited a physician who was unlikely to have been reimbursed by Medicaid for the visit and another 34 percent having made no visit during the last year. The estimates of public-sector costs and savings presented here relate only to the total number of women who relied on publicly funded contraceptive services.

As might be expected, women who were using prescription methods of contraception—the pill, the IUD or the diaphragm—were more likely to have made a visit to a provider during the preceding year than were those who relied on condoms, periodic abstinence or other methods.

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*This compares reasonably closely to the number of clinic patients who were using a reversible method at their last visit: In 1983, five million women were served by family planning clinics, and 4.4 million of them were using a reversible contraceptive method at the time of their last clinic visit (see: A. Torres and J. D. Forrest, "Family Planning Clinic Services in the United States, 1983," *Family Planning Perspectives,* 17:31, 1985). However, at that time, the number of women obtaining publicly funded care from a private physician, primarily through Medicaid, was unknown.

The proportion of users relying on publicly funded sources was highest among poorer women, ranging from 53 percent of those with family incomes less than poverty level to 15 percent of those with family incomes at or above 200 percent of poverty level. Women enrolled in Medicaid were much more likely than those not enrolled to have used a publicly funded provider (78 percent vs. 19 percent). One-third of users enrolled in Medicaid obtained care from a private physician.

As can be seen in Table 4, an estimated 9.2 percent of all women using reversible contraceptives in 1982 became unintentionally pregnant within one year.[*] The unintended pregnancy rate estimated for each group of method users was higher among those relying on publicly funded providers than among women who had used a private provider or had made no visit. For example, we estimated that 6.7 percent of patients of publicly funded providers who used the pill or IUD become pregnant, compared with 4.2 percent of those not using publicly funded providers. These differences are seen because clients of publicly funded providers are more likely to be young, unmarried, nonwhite and poor, and thus are more likely to experience contraceptive failure.[†]

Despite the higher method-specific pregnancy rates among women using publicly funded providers, there was little difference between the overall pregnancy rate calculated for all those who used publicly funded providers (9.5 percent) and the rate estimated for those who did not (9.1 percent). The overall rates are similar because the women relying on publicly funded providers were more likely than the others to be using more effective methods, especially the pill. As Table 4 shows, 73 percent of users of reversible contraceptives who went to a clinic or a Medicaid-reimbursed physician relied on the pill or IUD, compared with 48 percent of other women.

Based on the method-specific pregnancy rates (by age, race, marital status and poverty status), the 4.5 million users of reversible contraceptives who relied on publicly funded providers would experience 432,700 unintended pregnancies if they continued using their current method (Table 5, page 12). Of the 432,700 unintended pregnancies expected among these women, 186,900 would probably result in births and 189,400 in abortions. Of the births, 52,100 would be to women already enrolled in Medicaid, 15,400 would be to women newly eligible according to 1982 eligibility criteria because they were having a child and an additional 48,600 would be to women newly eligible for pregnancy-related care according to 1989 eligibility criteria. Some 52,800 Medicaid recipients would have abortions.

The estimated total number of unintended pregnancies would be 1.2 million if publicly funded contraceptive care were unavailable and women followed Pattern I, nearly 1.5 million if they followed Pattern II, 2.1 million under Pattern III and 3.5 million under Pattern IV. Thus, the number of additional unintended preganancies that would occur in the absence of publicly funded services ranges from more than three-quarters of a million under Pattern I to 3.1 million under Pattern IV.

The number of births and abortions that would occur if these women were to switch to alternative patterns of contraceptive use and risk of unintended pregnancy rather than continue using their current method are also shown in Table 5. The total number of births expected ranges from 520,300 in Pattern I (333,400 more than if these women were to continue using their current method) to more than 1.5 million under Pattern IV (over 1.3 million more). The number of births among women who would be eligible for Medicaid under current standards ranges from 305,800 to 853,100—many more than the 116,100 that would occur if women had continued access to publicly funded contraceptive services. The total number of abortions would be 527,700 under Pattern I and more than 1.5 million under Pattern IV, anywhere from 338,300 to almost 1.4 million more, respectively, than the 189,400 that would occur under current conditions.

The additional public-sector expenses that would result if publicly funded contraceptive services were not available and if the women now relying on them were to follow one of the alternative patterns are shown in Table 6 (page 13). Additional expenditures based on the levels of Medicaid eligibility in 1982 are shown in the upper portion of the table. These are appropriate for estimating the savings occurring as a result of public-sector family planning services in FY 1982. The total savings range from $0.6 billion under Pattern I to $0.9–$1.4 billion under Patterns II and III and to $2.5 billion under Pattern IV.

Federal and state expenditures for reversible contraceptive services (through both family planning clinics and Medicaid reimbursement of private physicians) totaled $328,323,000 in FY 1982.[31] Comparing savings with these costs reveals a savings/expenditure ratio for Pattern I of 1.95, indicating that $1.95 in medical and social welfare costs were saved for every $1.00 spent on family planning services. The ratios are higher for Patterns II and III ($2.69 and $4.16, respectively) and reach $7.57 under Pattern IV.

Table 4. Percentage distribution of women using reversible contraceptives and estimated annual unintended pregnancy rate, by method used, according to most recent type of provider, 1982

Method	Type of provider		
	Total	Publicly funded	Privately funded or no visit
% distribution			
Pill or IUD	53.3	72.5	47.6
Diaphragm	12.3	11.8	12.4
Condom	18.2	8.7	21.0
Periodic abstinence	5.9	1.9	7.0
Other	10.3	5.0	11.9
Total	100.0	100.0	100.0
Unintended pregnancy rate			
Total	9.2	9.5	9.1
Pill or IUD	5.0	6.7	4.2
Diaphragm	13.9	16.2	13.3
Condom	11.1	13.9	10.8
Periodic abstinence	12.9	21.4	12.2
Other	19.8	23.5	19.3

Sources: **Percentage distribution**—Tabulations from the 1982 National Survey of Family Growth. **Pregnancy rate**—See Appendix.

The lower portion of Table 6 shows the savings and savings/expenditure ratios when the expansion of Medicaid eligibility levels since the early 1980s is taken into account. (We have added savings for births among women who would have been eligible for the expanded Medicaid coverage if the 1989 eligibility levels had been in effect at the time of the 1982 NSFG to the savings shown in the upper portion of Table 6.) The additional expenditures that would be incurred by shifts from the currently used methods to Patterns I–IV under these conditions range from $953 million if Pattern I were followed to $1.3 billion under Pattern II, $2.0 billion under

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[*] The method-specific pregnancy rates for all women are slightly different from those reported in Jones and Forrest (reference 21) because the subgroup-specific failure rates are weighted with a slightly different distribution of women.

[†] Among users of reversible contraceptives who rely on publicly funded providers, 22 percent are aged 15–19 and 39 percent are 20–24, compared with nine percent and 24 percent, respectively, of those using other sources. Likewise, 68 percent of those relying on publicly funded providers are unmarried and 27 percent are nonwhite, compared with 36 percent and 13 percent of those using other providers. Some 30 percent of those relying on publicly funded providers have family incomes below poverty level and 14 percent have incomes between 100 and 149 percent of poverty level, while among women relying on other providers, these proportions are eight percent and 10 percent, respectively.

Table 5. Estimated number of unintended pregnancies, births and abortions* expected in one year among women now using reversible contraceptives obtained from publicly funded providers, and number expected if public funding of family planning services were unavailable, by woman's Medicaid status, according to various patterns of use

Woman's Medicaid status	Continue current method	Pattern I	II	III	IV
Unintended pregnancies					
Total	432,700	1,205,000	1,492,700	2,135,500	3,528,800
Enrolled	120,600	307,100	377,000	521,600	849,700
Would be eligible if woman had child, under 1982 regs.	35,600	88,800	109,200	147,800	239,700
Would be eligible if woman had child, under 1989 regs.	111,900	307,200	384,400	528,800	869,900
Not eligible	164,800	502,000	622,100	937,400	1,569,600
Births					
Total	186,900	520,300	644,900	921,000	1,521,500
Enrolled	52,100	133,600	164,400	227,000	370,200
Would be eligible if woman had child, under 1982 regs.	15,400	38,600	47,600	64,400	104,500
Would be eligible if woman had child, under 1989 regs.	48,600	133,600	167,300	229,900	378,400
Not eligible	70,700	214,400	265,600	399,500	668,600
Abortions					
Total	189,400	527,700	653,300	936,500	1,547,800
Enrolled	52,800	133,400	163,400	226,400	368,600
Would be eligible if woman had child, under 1982 regs.	15,400	38,500	47,300	64,100	103,900
Would be eligible if woman had child, under 1989 regs.	48,700	133,500	167,000	229,800	377,900
Not eligible	72,500	222,400	275,700	416,200	697,400

*Miscarriages are included among all unintended pregnancies but are not shown separately.

Pattern III and $3.7 billion under Pattern IV. The ratios under these conditions of eligibility range from $2.90 saved for every $1.00 spent under Pattern I to $4.02 under Pattern II, $6.19 under Pattern III and $11.26 under Pattern IV.

Estimates of the total savings at recent levels of funding are shown in Table 7. We have assumed that the ratios of savings to expenditures in recent years are the same as those calculated under conditions of expanded Medicaid coverage for pregnancy-related and pediatric care. In FY 1987, $412 million was spent on public funding for contraceptive services;[32] thus, given the Pattern I ratio of 2.90, the lowest estimate of total savings is $1.2 billion. Similarly, the total savings are $1.7 billion under Pattern II, $2.6 billion under Pattern III and $4.6 billion under Pattern IV.

Savings on Medicaid expenses for pregnancy-related care and for infant and pediatric care range from $875 million under Pattern I to nearly $3.4 billion under Pattern IV. In each case, such expenditures account for 73 percent of total savings. Savings in AFDC payments range from a low of $192 million to a high of $739 million and account for 16 percent of total savings, while savings on WIC and food stamps are six and three percent, respectively. All of these savings result from prevented births, and together account for 98 percent of total savings. Although the number of prevented abortions is slightly higher than the number of prevented births, a much smaller proportion of women are eligible for publicly funded medical care for abortion, and the cost of each funded abortion is much less than the cost of each funded birth. Thus, expenditures on abortion would account for only two percent of all savings.

Discussion

How important are publicly funded contraceptive services, and what is their impact? From one perspective, the impact of making contraceptive services available to those who might not be able to obtain them otherwise occurs at a personal level, for each individual client. In this study, we have taken a different perspective by looking at the aggregate impact of the total dollars spent by public sources to provide contraceptive services to women.

Women making visits for contraceptive care to publicly funded providers may receive prescriptions for appropriate methods, as well as free or low-cost contraceptive supplies. Many also receive a variety of health and educational services, including physical examinations, screening for and treatment of sexually transmitted diseases, counseling and referral to other health providers for specialized care.[33] This analysis has focused on a narrow but crucial area of impact—the prevention of unintended pregnancies and the resultant savings in public expenditures.

Almost one-quarter of all women using reversible contraceptives and one-third of women using the most effective reversible methods (the pill and IUD) received family planning care from a publicly funded provider in the preceding year. Yet women relying on publicly funded providers are disproportionately poor, a fact reflecting the purpose of such funding—to provide care to those who would find it difficult or impossible to obtain contraceptives on their own. Publicly funded providers serve more than three-quarters of women poor enough to be enrolled in Medicaid who use reversible contraceptives, as well as over half of all women with family incomes less than poverty level and over one-quarter of those with incomes between 100 and 199 percent of poverty.

We have estimated that the use of contraceptives obtained from publicly funded providers is responsible for preventing up to 3.1 million unintended pregnancies annually (1.3 million unintended births, 1.4 million induced abortions and 400,000 miscarriages) when compared with the numbers of pregnancies that would occur if these women used no contraceptive methods. We estimate that for every 1,000 women using reversible contraceptives through publicly funded providers, 95 became pregnant over one year's time, while 683 more would have become unintentionally pregnant if they had had no access to contraceptives, resulting in 295 additional unintended births, 300 abortions and 88 miscarriages per 1,000 women. The amount of money saved as a result of contraceptive use among women relying on publicly funded providers (compared with what would be needed if no contraceptives at all were used) represents $11.30 for each dollar spent to provide those services. On the basis of recent levels of contraceptive service expenditures, we find that savings total $4.6 billion.

Even assuming a more likely scenario—that many women would use some type of contraceptive, even if they could not get services from a publicly funded provider—access to contraceptive services clearly helps substantial numbers of women avoid unintended pregnancies. It is difficult to estimate exactly how many unintended pregnancies, births and abortions are prevented, but using the three other models of probable behavior if services were unavailable, we estimate that from 772,000 to 1,703,000 unintended pregnancies are prevented in one year's time: between 333,000 and 734,000 unintended births and from 338,000 to 747,000 induced abortions. For every 1,000 women using reversible contraceptives who relied on a publicly funded provider for care, anywhere from 170 to 376 unintended pregnancies were prevented, including 74–162 unintended births and 75–165 abortions.

There are reasons to believe that each of Patterns I–III describes a likely scenario if publicly funded contraceptive services were to become unavailable. If one measure is desired, an average of these three patterns may be more appropriate than any one of the three. It suggests that 1.2 million unintended pregnancies are averted by publicly funded services, including 509,000 unintended births and 516,000 abortions. For every 1,000 women using reversible contraceptives and relying on a publicly funded provider, 260 unintended pregnancies are prevented, including 112 births and 114 abortions.

The amount of money it would cost if these unintended pregnancies were not prevented is much more than the cost of providing contraceptive services. We estimate that for every government dollar spent on family planning services, from $2.90 to $6.20 (an average of $4.40) is saved as a result of averting expenditures on medical services, welfare and nutritional services in the two years following a birth.

For several reasons, these figures are not directly comparable to earlier estimates. We include women who obtained publicly funded family planning care from private physicians as well as from clinics, we examine savings from a different mix of services and we calculate the savings for a two-year period. The conclusions are similar, however: Expenditures for family planning services save money that the federal and state governments would otherwise have to spend in other areas of care, with the total amount saved by recent levels of federal and state expenditures for contraceptive services ranging from $1.2 billion to $2.6 billion and averaging $1.8 billion. Almost three-quarters of these savings ($876 million to $1.9 billion) are in Medicaid, while savings in AFDC range from $192 to $407 million. These are substantial amounts, monies that as a result are available to serve other needs or to prevent tax increases.

Our findings indicate once again that publicly funded family planning services play an important role in the United States by allowing substantial numbers of women to prevent unintended pregnancies, births and abortions. The amounts spent to provide these services are small relative to those for many other types of health care, but they result in large savings. By implication, the results also suggest the potential impact of cutting back on such services. Without access to publicly funded contraceptive care, many women, especially those who are poor, would no longer be able to prevent unintended pregnancies and would have unintended births or abortions.

The substantial benefits of current levels of publicly funded family planning services, in terms of unintended pregnancies prevented and public savings on health, welfare and nutritional services, should not be taken to indicate that no more need be done, however. Under the pattern of contraceptive use seen in 1982, almost one in 10 women using reversible contraceptive methods obtained through publicly subsidized providers became unintentionally pregnant. The gap between the low levels of unintentional pregnancy that contraceptive practice can theoretically achieve and the actual levels obtained in normal use is well documented.[34] In addition, a small but significant number of women at risk of unintended pregnancy use no method of contraception, and such women account for over half of all unintended pregnancies and for half of all abortions.[35] Improving the provision of contraceptive services, education and counseling would help couples practice contraception more effectively and would reduce the number of unintended births and abortions experienced by U.S. women.

Table 6. Estimated public-sector expenses averted (in 000s) among women now obtaining reversible contraceptives from publicly funded providers and ratios of these savings to costs, by four patterns of contraceptive use, based on 1982 and 1989 Medicaid eligibility qualifications

Measure	Pattern			
	I	II	III	IV
1982 eligibility levels				
Total expenses averted	$640,270	$883,705	$1,366,659	$2,484,834
Births	$625,272	$863,131	$1,334,354	$2,426,098
Abortions	$14,998	$20,574	$32,305	$58,736
Savings/cost ratio*	1.95	2.69	4.16	7.57
1989 eligibility levels				
Total expenses averted	$952,753	$1,319,961	$2,033,258	$3,696,832
Births	$937,755	$1,299,387	$2,000,953	$3,638,096
Abortions	$14,998	$20,574	$32,305	$58,736
Savings/cost ratio*	2.90	4.02	6.19	11.26

*Additional expenses that would have been incurred under each pattern of contraceptive use and risk of unintended pregnancy if public funding had not been available for contraceptive services (savings) divided by $328,323,000, the amount of public funding for contraceptive services in FY 1982 (cost).

Table 7. Estimated public-sector savings (in 000s) resulting from public expenditures for contraceptive services in FY 1987,* by type of saving†

Type of saving	Pattern			
	I	II	III	IV
Total	**$1,195,574**	**$1,656,369**	**$2,551,458**	**$4,639,014**
Medicaid	875,243	1,213,950	1,869,170	3,398,490
AFDC	191,503	264,809	406,718	739,487
WIC	71,803	99,059	153,481	279,056
Food stamps	38,201	52,729	81,544	148,262
Abortion	18,824	25,821	40,545	73,719

*Savings were estimated by multiplying the savings/expenditure ratios for expanded, 1989 levels of Medicaid eligibility (shown in Table 6) by $412 million (the amount of FY 1987 federal and state expenditures for contraceptive services).

†Savings by type were estimated according to the savings in the early 1980s, adjusted for expanded levels of Medicaid eligibility.

Appendix

- *Number of unintended pregnancies.* Our adjustment of the 12-month use-failure rates calculated by Jones and Forrest[36] was based on two assumptions, one concerning the proportion of women who had used their method for an interval longer than 12 months and the other regarding the degree to which the pregnancy rate in intervals beyond 12 months is lower than the 12-month rate. There are no data on the proportion of clinic patients who use their methods for more than one year. We know that in 1983, 59 percent of women visiting clinics for family planning services were returning patients, and that 41 percent were new patients to that clinic.[37] We also know that in 1979, 62 percent of clinic patients had been using no method or a nonprescription method prior to their clinic visit.[38] However, even continuing clinic patients may switch methods thus beginning a new use-interval. We finally assumed that 50 percent of all women using a reversible method had done so for more than one year.

Few population-based studies have calculated use-failure rates for periods beyond 12 months or overall use-failure rates in a population of users at differing use-interval lengths. A study of failure rates among married women in the United States for the period 1970–1973[39] that used data from the 1973 NSFG found that among women seeking to delay having a child until a later time, the second-year failure rates of pill users and of all users were 90 percent and 71 percent, respectively, of the first-year rates. We estimated that the second-year rate for methods other than the pill was 54 percent of the first-year rate, based on the fact that 47 percent of married women using reversible contraceptives at the time of the 1973 NSFG[40] used the pill and that 53 percent of users relied on a method other than the pill ($0.47 \times 0.90 + 0.53 \times 0.54 = 0.71$). If these ratios of second-year failure rates to first-year rates are applied to all 19.8 million women who were using oral contraceptives or the IUD (10.6 million) or other reversible methods (9.2 million) in 1982, they imply a second-year failure rate 73 percent as great as the first-year rate ($0.73 = [10.6 \times 0.90 + 9.2 \times 0.54]/19.8$). Given that women relying on publicly funded providers for reversible contraception are more likely than women in general to use the pill or IUD (73 percent vs. 53 percent), these data imply an average second-year failure rate 80 percent as great as the first-year rate among those obtaining care from publicly funded providers ($0.73 \times 0.90 + 0.27 \times 0.54 = 0.80$).

Average annual rates of unintended pregnancy among women using a method were calculated by Charles Westoff from the 1982 NSFG[41] in an analysis that included women who used a method prior to the survey date, regardless of the length of the use-interval, and adjusted for underreporting of abortion based on women's age, race and marital status. The contraceptive method used and the woman's poverty status were not taken into account in this adjustment, however, so Westoff's rates are not directly comparable to the pregnancy rates calculated by Jones and Forrest. To estimate the relationship between Westoff's average annual pregnancy rates and the Jones and Forrest first-year rates, we compared average annual rates for married and unmarried women computed in the former study with first-year rates calculated by William Grady and colleagues from the 1982 NSFG data,[42] which had also been adjusted for abortion underreporting based on women's age, race and marital status. We estimated ratios (by method and marital status) between the annual rates for women in all use-intervals and the first-year rates and applied these ratios to the comparable number of women using reversible methods and relying on publicly funded providers. We found the average annual rates to be 86 percent as great as the first-year rates calculated in the Grady study.

Using this information as a rough indicator, we assumed that half of the users are in their first year of use and experienced annual pregnancy rates similar to those calculated by Jones and Forrest and that the use-failure rates for use-intervals longer than 12 months were only 75 percent as great as the rates for the first 12 months. The use-failure rates for all women included in this analysis are therefore estimated to be 87.5 percent of the rates calculated by Jones and Forrest ($0.50 \times 1.00 + 0.50 \times 0.75 = 0.875$).

- *Estimated public-sector costs of unintended pregnancies.* Because most births to women who became pregnant within 12 months of their family planning visits in FY 1982 (the year for which contraceptive service expenditures are calculated) would not have occurred until FY 1983, the 1985 costs have been reduced according to the change in the consumer price index between 1983 and 1985.[43] No allowance was made for the increase in the consumer price index in calculations of the second-year costs of pediatric care, food stamps or WIC. Instead of adjusting the 1985 monthly AFDC payments, we used actual 1983 payment levels.[44]* No adjustment was made for any increase in payment levels for the second year after birth. The public-sector costs of abortion in FY 1983 are taken from an AGI survey of state officials.[45]

The calculations began with estimates of the Medicaid expenses for maternity and infant care estimated by Torres and colleagues,[46] which were deflated from 1985 levels to 1983 levels by the change in the national consumer price index. We used the change in the overall consumer price index, rather than the medical care price index, on the assumption that Medicaid reimbursement levels did not rise as steeply during this period as did total medical care costs. For each Medicaid-eligible woman, the costs of maternity care (physician fees for prenatal, delivery and postpartum services and hospital charges for the mother and a healthy newborn) averaged $2,036, and those of infant care (neonatal intensive care and physician and hospital care during the infant's first two years of life) averaged $1,638.

In 1983, the average national difference in AFDC payments between a two-person family and a three-person family was $65.50 per month, and the average payment for a new two-person family was $331.54.[47] We assumed that 78 percent of those covered by Medicaid or eligible for Medicaid if they were to have a child would receive cash assistance or AFDC, and that they would receive welfare for an average of 15 months in the first two years after birth.[48] Thus, the total average additional AFDC expenditure was $766 for someone currently covered by Medicaid and $3,879 for someone newly eligible.

The average expenditure for food stamps for a new recipient in 1985 ($63 per month)[49] was deflated to $58.32 per month for 1983, again based on changes in the consumer price index. As had Torres and colleagues, we assumed that food stamp expenditures are made for 75 percent of those on Medicaid for an average of nine months. The payment for those currently on Medicaid was reduced, according to food stamp program regulations, by 30 percent of the increased AFDC payment of $65.50, to $39 per month. The average increased food stamp expenditure was $261 for those currently on Medicaid and $394 for those newly eligible.

Additionally, Torres and colleagues assumed that all pregnant women on

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*The average monthly payments for a two-person and a three-person family were calculated for the United States as a whole by weighting the state AFDC payment levels in FY 1983 by the total number of births in the state in 1983.

AFDC—the equivalent of 78 percent of all pregnant women covered by Medicaid—would receive WIC services for an average of six months for themselves and 12 months for their baby. They further estimated that in 1985, for each birth to a woman on Medicaid, an average of $590 was spent during the first two years after delivery for WIC services (equivalent to $756 for women actually receiving WIC). In 1983 dollars, WIC services would have averaged $546 per birth to a woman enrolled in Medicaid (equivalent to $700 per woman actually receiving WIC).

A total of 216,092 women had abortions in 1983 that were paid for through Medicaid, almost all of them funded solely by the individual states.[50] Few or no abortions were funded in many states, however, and the total number of women enrolled in Medicaid who obtained abortions in 1983 is not known. It would be inappropriate to apply the average cost of a publicly funded abortion in FY 1983 ($330) to the total number of abortions estimated to have occurred among women covered by Medicaid under the various alternative patterns, since not all of them would be able to obtain a publicly funded abortion. We know, however, that in 1987, 24 percent of women obtaining abortions were enrolled in Medicaid;[51] if the proportion had been the same in 1983, an estimated 375,000 women enrolled in Medicaid would have obtained abortions.[52] The 216,000 abortions actually paid for by federal or state funds in 1983 thus represents an estimated 58 percent of all abortions obtained in that year by women enrolled in Medicaid. Since the average cost of a publicly funded abortion in FY 1983 was $330, we estimate the average cost per abortion to a woman enrolled in Medicaid to have been $186 (58 percent of this level).

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Teenage Welfare Receipt and Subsequent Dependence Among Black Adolescent Mothers

By Greg J. Duncan and Saul D. Hoffman

Summary

Black teenage mothers who receive benefits through Aid to Families with Dependent Children (AFDC) around the time they give birth are more likely to be receiving AFDC at age 26 than are other black teenage mothers or women who do not have a teenage birth, even after adjustments are made for differences in parental background and the economic accomplishments of siblings. Moreover, they are also more likely to have a lower earned family income and a lower total family income (when transfer income such as AFDC is taken into account). The results of this analysis suggest that AFDC receipt around the time of a nonmarital teenage birth itself may be an independent cause of future economic problems for these young mothers, although they do not elucidate the causal mechanism by which such an association might operate.

Introduction

Concern that government aid to poor families may induce dependence is as old as proposals for aid themselves. In the United States, fears that such aid might induce dependence seem strongest for the principal transfer programs for poor families with children—Aid to Families with Dependent Children (AFDC) and Medicaid. Because Medicaid often provides better medical insurance coverage than is available from the employers of low-wage workers, and since AFDC recipients usually lose one dollar of transfer income for every dollar of earned income, critics often accuse both programs of discouraging work effort. Furthermore, until the Family Support Act of 1988, nearly half of the states confined AFDC benefits to families headed by a single parent, raising concern that the program discourages marriage and encourages divorce or separation among intact families. Others argue that such programs somehow destroy the positive attitudes and values of recipients, leading one author to urge that transfer programs like AFDC be approached "as a good physician uses a dangerous drug—not at all if possible, and no more than absolutely necessary otherwise."[1]

Fears of a widespread or inevitable "welfare trap" have been allayed somewhat by David Ellwood's research showing that only a minority of women who receive AFDC have long welfare "careers."[2] In his study, about 30 percent of those who received welfare did so for 1–2 years, while another 30 percent did so for eight or more years; the median length of welfare receipt was less than four years. In addition, studies based on caseload files and other survey data show similar results in terms of the length of welfare receipt.[3] Clearly, long-term welfare reliance characterizes only a minority of recipients. Indeed, even Charles Murray, whose book *Losing Ground* led the conservative attack on Great Society welfare programs, now admits that current programs appear to function as benign income-loss insurance programs for many, and perhaps, most recipients.[4]

But both Ellwood and Murray also found that the duration of welfare reliance differed markedly among different types of recipients. For example, Ellwood reported that about 14 percent of women who were 25 years of age or older when they first became AFDC recipients and who had previous work experience received AFDC for as many as nine years, compared with more than 45 percent of never-married women with young children who first received AFDC before age 25. Accordingly, concern ought to focus on these younger recipients. Unfortunately, empirical studies of various aspects of welfare dependency have rarely distinguished younger from older recipients.

Long-term receipt of welfare among teenage mothers is not conclusive evidence that the welfare system itself causes dependence. A pattern of relatively continuous welfare reliance may be a result of "state dependence" (i.e., a causal process in which initial receipt produces changes in attitudes or behavior that make subsequent receipt more likely); however, such a pattern may also reflect "heterogeneity," in which characteristics such as family background, neighborhood environment, individual values and abilities are the cause both of the beginning of a period on welfare and of its continuation. Studies by Mark Plant and Rebecca Blank that estimated statistical models of state dependence in the general welfare population found at most only weak evidence of it.[5]

A more direct approach would be to estimate the effects of welfare on factors such as family composition and work effort and on attitudes and values. If there is a welfare trap, some changes in behavior ought to be observable. Behavioral evidence compiled to date suggests that welfare receipt does indeed reduce labor supply somewhat,[6] but seems to have little systematic impact on fertility or marriage.[7] In addition, studies of two national samples do not support a causal role of welfare in worsening individual attitudes (such as locus of control or future orientation).[8]

Almost none of the studies of the possible effects of welfare on work effort,

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change in family composition or values and attitudes distinguish teenage mothers from other recipients. However, another body of literature—on the consequences of teenage births—does focus on teenage mothers, and has shown that women who have children in their teen years are worse off economically a decade or more later than are women who delay childbearing until their 20s, primarily because the former generally complete less schooling and have larger families to support.[9] However, a detailed examination of a sample of teenage mothers in Baltimore led Frank Furstenberg and colleagues to emphasize the diversity of the teenage mothers' experiences; they may be worse off on average, but averages conceal many instances where such women end up doing quite well.[10] Unfortunately, research in this area rarely distinguishes teenage mothers who start to receive welfare after the birth of their first child from those who do not.

In sum, despite evidence that teenage mothers are those most likely to be dependent on long-term public assistance, neither statistical studies disentangling heterogeneity and state dependence from usage patterns nor studies of the possible mechanisms—reduced labor supply, delayed marriages or changes in attitudes—have distinguished teenage mothers from other recipients. In this article, we use data from the Panel Study of Income Dynamics (PSID) on women who were observed both throughout their teenage years and also in their mid-20s to investigate the extent to which welfare receipt by teenage mothers affects their future economic independence. We distinguish teenage mothers receiving AFDC shortly after the birth of their first child from women with other fertility experiences. The outcome variables, all measured when the women were in their mid-20s, include AFDC receipt and income from other sources. In looking at the effect of early AFDC receipt on subsequent dependence, our approach is closer to the statistical models of Blank and Plant than to the studies by other investigators of the mechanisms by which welfare receipt may affect subsequent dependence. However, rather than using a statistical model to distinguish state dependence from heterogeneity, we instead use a rich set of parental and sibling measures to adjust for family and neighborhood-based heterogeneity directly.

Methodology

The data used in our analysis come from the PSID's 1985 cross-year file. The basic sample consists of 316 black women who were members of PSID households between ages 14 and 26 and also were members of households where 1985 interviews were conducted (when particularly extensive marital and fertility information was gathered about all family members). Small sample sizes among white women with out-of-wedlock teenage births prevented our conducting a parallel analysis for whites.[*] Because of the duration and design of the PSID, our data (when weighted) are representative of black women who reached age 26 between 1980 and 1985.[†]

The requirement that these women be observed first between ages 14 and 19 was imposed so births could be compared with data on possible receipt of AFDC and so their family conditions (as reported by their parents) could be measured as of age 14, prior to the fertility events of interest. The "window" was then extended forward to age 26, so economic and demographic outcomes several years after a teenage birth could be measured.

Births were considered to be out-of-wedlock teenage births if they occurred prior to both the mother's 20th birthday and the mother's first marriage. A birth was considered to accompany AFDC receipt if AFDC income was reported in either of the first two years following the child's birth.[‡] Of the 316 young black women, 131 had at least one out-of-wedlock birth before age 20, and 82 of these had at least one out-of-wedlock teenage birth accompanied by receipt of AFDC. The corresponding weighted proportions were 34 and 23 percent of the young women, respectively.

The sample of black teenagers was divided into four categories for analysis: those who had had at least one teenage out-of-wedlock birth that was accompanied by AFDC receipt, those who had had at least one teenage out-of-wedlock birth that was not linked to the receipt of AFDC, those who had had no out-of-wedlock births but at least one marital birth during their teenage years and those who had had no teenage births. The first category (births associated with the receipt of AFDC) was further divided into subcategories of interest—AFDC benefit levels in the state of residence,[§] the age of the mother at the time of her first birth and whether the teenage mother lived with a parent or independently in the year following the birth. After applying the PSID inverse selection probability weights, we analyzed how various economic and demographic outcomes—all measured at age 26—differed among the various categories.

Findings

The results of our analysis are presented in Table 1 (page 18). The earned family income column is based on income at age 26 that was subject to federal income tax (which, for these young families, consisted almost entirely of the labor income of the woman herself and, if she was married, that of her husband). Since income from AFDC and most other transfers is not taxed, it is excluded from this measure. The income-to-needs ratios adjust income for family size by dividing total family income by the federal government's annually calculated poverty thresholds for families with differing compositions, based on the number, age and sex of family members. The poverty level for a family of four in 1985 dollars was approximately $11,000; a family of four with an annual income of $33,000 would thus have an income-to-needs ratio of 3.0, while a family of four with an income of $5,500 would have a ratio of 0.5 and would be deemed poor.

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[*] Regressions comparable to those reported in this article were run for the white sample as well, despite the small number of observations, and the results were remarkably similar to those reported here for blacks.

[†] Out-of-wedlock fertility and total fertility rates for this PSID subsample are quite close to those found in 1970–1984 vital statistics data. According to PSID estimates, unmarried black women ages 15–17 had 75 births per 1,000 women and those 18–19 had 116 births per 1,000; corresponding vital statistics rates are 74 and 122 per 1,000, respectively (see: S. L. Hofferth and C. D. Hayes, eds., *Risking the Future: Adolescent Sexuality, Pregnancy and Childbearing*, Vol. II, National Academy Press, 1987, Table 6.4). According to the vital statistics data, these rates declined modestly from 1970 to 1984; however, the trend seen in the PSID data was much more erratic, owing in part to small sample sizes.

[‡] Since the majority of out-of-wedlock births occurred in three-generation families where the teenage mother was not the head of the household, our rules were somewhat complicated: If the teenage mother herself or the family in which she resided reported AFDC income in either of the two years following the out-of-wedlock birth, that birth was considered to have been accompanied by receipt of AFDC. Cases where there was no reported AFDC income but some income reported as "other welfare" were examined to assess whether it was likely that the income was from AFDC.

[§] Specifically, we divided the sample into two mutually exclusive groups (higher-than-average vs. lower-than average benefits) according to the AFDC guarantee level for a family of two for the mother's state or states of residence between ages 15 and 19, inflated to 1985 price levels using the consumer price index. (For data on AFDC guarantee level by state, see: Committee on Ways and Means, U.S. House of Representatives, "Background Material and Data on Programs Within the Jurisdiction of the Committee on Ways and Means," U.S. Government Printing Office, Washington, D.C., 1987.)

Table 1. Among black women who reached age 26 between 1980 and 1985, number, percentage distribution and various economic and demographic outcomes, by teenage birth history

Birth History	N	Total % (weighted)	% receiving AFDC	% poor	% married	Earned family income (in 000s)	Total family income (in 000s)	Income-to-needs ratio	% female-headed household with children	% completed high school
Total	316	100.0	23	23	40	$14.4	$16.6	2.2	43	84
≥1 out-of-wedlock AFDC births	82	23	59	51	26	8.6	11.5	1.3	73	62
Low-benefit states	35	9	44	55	23	8.6	10.3	1.1	76	71
High-benefit states	47	14	68	49	28	8.7	12.3	1.4	70	55
<18 at first birth	47	12	55	39	41	12.0	15.0	1.5	56	44
18–19 at first birth	35	11	63	65	9	4.9	7.6	1.0	91	82
Lived with parents after birth	68	18	23	54	30	9.6	12.0	1.3	67	64
Lived independently	14	5	80	40	11	4.7	9.4	1.3	89	54
No AFDC births; ≥1 out-of-wedlock births	49	11	16	20	51	17.7	19.4	2.2	48	72
No out-of-wedlock births; ≥1 marital births	41	12	18	9	72	15.9	17.7	1.9	23	92
No births	144	54	12	15	37	15.9	17.9	2.6	34	95

Note: All dollar amounts have been inflated to 1985 price levels using the Consumer Price Index. Source: Panel Study of Income Dynamics.

Table 1 shows that, on average, women who had given birth as teenagers and had received AFDC were doing poorly by their mid-20s, both absolutely and relative to all other groups. Three-fifths of these women were still receiving AFDC, half were poor and only one-quarter were married; in comparison, among the other young women who had given birth as teenagers, fewer than one in five were receiving AFDC at age 26, one-fifth or fewer were poor and between half and three-quarters were married. The average earned family income at age 26 among the mothers who had received AFDC as teenagers ($8,600) was about half that of the other groups (between $15,900 and $17,700); even when transfer income is included, their family income was still at least 35 percent lower than that of the other groups ($11,500, compared with $17,700–$19,400).

Furthermore, women who had had a teenage birth but had not received AFDC were much better off at age 26 than were the women who had received AFDC, in large part because the nonrecipients were twice as likely to have married (51 percent vs. 26 percent). Surprisingly, women with out-of-wedlock births not linked to AFDC compared favorably in total family income and earned income with women who were childless when they reached age 20.[*]

Table 1 also presents information for the various subsets of women who had had an AFDC-related out-of-wedlock teenage birth. When compared with women in low-benefit states, those living in high-benefit states had a considerably higher rate of AFDC receipt at age 26, a similar average amount of earned income, a higher average total family income and less schooling. Some of the difference in rates of AFDC receipt may be caused by the fact that women with identical earned incomes may be eligible in high-benefit states and ineligible in low-benefit states.

Somewhat surprisingly, women who had had an AFDC-related birth before age 18 were doing better at age 26 than women who had had a child when they were 18 or 19: Their earned family income was substantially higher ($12,000 vs. $4,900), as was their total family income ($15,000 vs. $7,600); they were also far less likely to be poor (39 percent vs. 65 percent). Although many more of the 18–19-year-old mothers had completed high school by age 26, very few of them had married, and almost all were heading single-parent households.

The final comparison—between women who had lived independently and those who had lived with their parents shortly after the AFDC-related teenage birth—is complicated by the fact that the sample size of the former group is very small, as well as by the possibility that unmeasured differences might have affected both the women's likelihood of living independently and the outcomes we examine. However, this comparison shows women who had established their own households shortly after their teenage birth to have much lower earned incomes and much higher rates of AFDC receipt.

The data in Table 1 do not, of course, establish that AFDC receipt itself adversely affected the subsequent economic status of teenage mothers. The observed pattern could reflect the effects of poor marital and labor market opportunities, unfavorable family backgrounds or personality characteristics that affected both AFDC receipt and the various outcomes.

To examine whether AFDC receipt had an independent effect on these outcomes, we took advantage of the extensive parental and sibling information collected in the PSID. The following regression analyses control for the effects of a variety of family characteristics (all measured when the reference women were age 14), including region, city size, total family income, whether any family income came from AFDC, mother's and father's education, whether the woman was a granddaughter of the household head, the number of individuals in the household who were under age 18 or who were 18 and older and a measure (obtained in the 1985 interview) of whether the young woman reported having grown up with both parents.

The regression analyses also take intrafamily differences into account by adjusting for differences in the economic attainment of the study women and that of their male and female siblings. The PSID data are unusual in that detailed information was collected on the economic attainment of siblings;[†] this information serves as a

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[*] The division at age 20 is rather arbitrary. Twenty-five percent of the black women who had graduated from high school and had not had an out-of-wedlock birth prior to age 20 had had at least one out-of-wedlock birth between ages 20 and 25 (see: G. J. Duncan and S. D. Hoffman, "Teenage Underclass Behavior and Subsequent Poverty: Have the Rules Changed?" Survey Research Center, Ann Arbor, Mich., 1989).

[†] Siblings are defined as all children or stepchildren of the household head present in the 1968 household if the woman in question was herself a child or stepchild in that household. If she was a grandchild or stepgrandchild of the household head, siblings were taken to be all other present grandchildren or stepgrandchildren of the household head.

Table 2. Simple and regression-adjusted effects of teenage birth history among black women who reached age 26 between 1980 and 1985 by various economic outcomes, and among various subgroups of women with one or more out-of-wedlock AFDC births

Birth history	Natural logarithm of earned family income		AFDC receipt		Natural logarithm of total family income		Family income-to-needs ratio	
	No controls	Parental and sibling controls	No controls	Parental and sibling controls	No controls	Parental and sibling controls	No controls	Parental and sibling controls
Main regression groups								
≥1 out-of-wedlock AFDC births	–1.28**	–0.73**	2.03**	2.23**	–0.75**	–0.48**	–0.97**	–0.54*
	(0.23)	(0.24)	(0.52)	(0.76)	(0.17)	(0.18)	(0.25)	(0.26)
No out-of-wedlock births, ≥1 marital births	–0.15	–0.12	0.12	0.38	–0.04	0.00	–0.33	–0.18
	(0.26)	(0.29)	(0.63)	(0.97)	(0.19)	(0.22)	(0.28)	(0.31)
No births	–0.03	–0.06	–0.35	–0.87	–0.12	–0.17	0.34	0.29
	(0.21)	(0.22)	(0.52)	(0.77)	(0.15)	(0.17)	(0.22)	(0.24)
R^2	0.17	0.27	na	na	0.10	0.17	0.16	0.26
AFDC subgroup regression								
Low-benefit state	–1.11**	–0.58	1.45*	2.28*	–0.97**	–0.52*	–1.13**	–0.46
	(0.28)	(0.30)	(0.60)	(0.90)	(0.21)	(0.23)	(0.30)	(0.33)
High-benefit state	–1.39**	–0.81**	2.44**	2.20**	–0.61**	–0.46*	–0.88**	–0.59*
	(0.25)	(0.26)	(0.56)	(0.82)	(0.19)	(0.20)	(0.27)	(0.29)
<18 at first birth	–1.01**	–0.49	1.88**	2.06**	–0.44*	–0.21	–0.77**	–0.42
	(0.26)	(0.27)	(0.56)	(0.85)	(0.19)	(0.20)	(0.28)	(0.30)
18–19 at first birth	–1.57**	–1.03**	2.21**	2.40**	–1.10**	–0.82**	–1.21**	–0.70*
	(0.27)	(0.29)	(0.58)	(0.86)	(0.19)	(0.21)	(0.29)	(0.31)
Lived with parents after birth	–1.14**	–0.64*	1.84**	2.43**	–0.74**	–0.42*	–0.98**	–0.50
	(0.24)	(0.25)	(0.53)	(0.80)	(0.18)	(0.19)	(0.26)	(0.27)
Lived independently after birth	–1.81**	–1.10**	2.92**	1.48	–0.79**	–0.74**	–0.95*	–0.70
	(0.35)	(0.37)	(0.78)	(1.08)	(0.26)	(0.28)	(0.38)	(0.40)

*Statistically significantly different from zero at $p<0.05$. **Statistically significantly different from zero at $p<0.01$.

Note: The omitted reference group in all regressions consists of black women who had an out-of-wedlock birth during their teenage years but did not receive AFCD over the next two years. Standard errors are given in parentheses. Parameter estimates for AFDC receipt were obtained from logistic regression; all other models were estimated with ordinary least-squares regression.

powerful control for family and neighborhood influences on the likely receipt of AFDC. To measure sibling attainment, we took all observations in the PSID in which siblings were between the ages of 21 and 30 and pooled them into sets classified by gender and by age ranges (21–25 and 26–30). For brothers, we averaged annual earned income across all person-years in which the brothers headed their own households and were not students. For sisters, family income other than AFDC was averaged across all person-years in which a sister was either the head of a household or married to the head of a household. As an indicator of whether sisters ever received AFDC, we used their reports of AFDC income across person-years in which they were either the household head or married to the head.

Although PSID data provide reasonably good controls for the family and neighborhood factors that might lead teenage AFDC recipients to do more poorly at age 26 than other teenage mothers, it is important to note that they fail to provide information on the abilities and attitudes of the young women themselves. Our analysis will thus overstate the potential causal role played by AFDC to the extent that individual differences account for both the decision to use AFDC as a teenager and the young women's economic outcomes at age 26.

Table 2 shows the effects of teenage AFDC receipt on economic independence at age 26 (the natural logarithm of family earned income), economic dependence (whether the women was receiving AFDC)* and living standards (the natural logarithm of total family income and the family income-to-needs ratio). The first column of coefficients for each dependent variable reflects no regression adjustments; apart from the logarithmic transformation of the income variables, these data are equivalent to the information presented in Table 1. The coefficients reported in the second column for each dependent variable are from a regression that includes the parental and sibling variables. The three income or income-to-needs regressions were run with ordinary least-squares regression, while the model using the dichotomous AFDC receipt variable was estimated with logistic regression. Black women who had an out-of-wedlock birth as teenagers but did not receive AFDC are the omitted category in each regression; coefficients thus reflect the differences between each group and these women.

If the apparent negative impact of AFDC receipt on future economic status largely reflected the effects of family background, the inclusion of these variables in the regression analyses ought to reduce the differences between recipients and nonrecipients so that they are no longer statistically significant. If the effects of AFDC receipt remain similar in each group, the evidence for the existence of a welfare trap would be strengthened.

As can be seen in Table 2, the association between teenage AFDC receipt and subsequent earned income was reduced but by no means eliminated when parental and sibling controls were included; the strength of the association was reduced from –1.28 to –0.73, but it remained statistically significant.* Furthermore, the strength of the relationship between teenage AFDC receipt and subsequent AFDC receipt actually increased slightly, from 2.03 to 2.23. The striking contrast in economic outcome between teenage mothers who did and did not receive AFDC seen in Table 1 thus persisted even after the adjustment for background and sibling measures.

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*Given the turnover among AFDC recipients, a snapshot picture of AFDC receipt at age 26 might be considered a very imprecise measure of dependence, and the dynamics of AFDC receipt make for a very diverse set of experiences for such women. However, the likely length of receipt observed at any point (e.g., age 26) is long: Ellwood has estimated that two-thirds of recipients at any point are in the midst of a duration of receipt that will last eight or more years (see: reference 2). Since women who begin receiving AFDC as teenagers have much longer than average lengths of public assistance, we would expect that the vast majority of 26-year-old recipients who had had AFDC-related teenage births would be in the midst of a long period of receipt.

Women who had not had an out-of-wedlock teenage birth were not statistically significantly different in terms of taxable income or AFDC receipt at age 26 from the comparison group of women who had had a teenage birth but who did not receive AFDC during the next two years. Clearly, the powerful adjusted associations between teenage births and subsequent economic dependence are restricted to women who had received AFDC shortly after the birth of their child.

The effects implied by the background-adjusted coefficients in the first row of Table 2 are very large. The coefficient for teenage AFDC receipt in the analysis of earned family income (–0.73) implies a predicted earned family income for such women half of that received by the other groups of women. Likewise, the coefficient for AFDC receipt at age 26 (2.23) implies that while 16 percent of women who had had an out-of-wedlock birth but had not received welfare as teenagers were receiving AFDC at age 26, that proportion would have been 64 percent if they had begun receiving AFDC when they gave birth.

One might argue that focusing on the standard of living provided by the woman's total income mignt be more appropriate than concentrating on the source of income at age 26 (e.g., earnings vs. AFDC). Not surprisingly, Table 2 shows that the addition of transfer income reduced the economic distance between women who had had an AFDC-related teenage birth and those in the other groups. However, the economic gap between recipients and nonrecipients with nonmarital births prior to their 20th birthday (–0.48) remained large and statistically significant, as did the family income-to-needs ratio.

To examine the role of state AFDC benefit levels and age and living arrangements at the child's birth, we repeated the regressions described above but substituted the various subcategories of women who had had an out-of-wedlock birth linked to the receipt of AFDC.† (As before, the omitted regression category consisted of women with teenage births not linked to AFDC receipt.) Table 2 shows that regression-adjusted earned family incomes were lower and AFDC receipt rates higher for women who had become mothers at ages 18–19 than for those who had had their children when they were younger than 18. In addition, earned income was lower in high-benefit states, although the addition of parental and sibling controls reversed the positive association between benefit levels and AFDC receipt rates at age 26. Earned income was also lower among young women who had lived independently from their parents. Most important, a comparison of the top and bottom panels of Table 2 indicates that none of the circumstances that had had relatively favorable consequences for an AFDC-related out-of-wedlock teenage birth—an earlier birth, residence with parents, low AFDC benefits—resulted in a level of economic independence that approached that enjoyed by the other women studied.

Discussion

Our look at the economic circumstances of women in their mid-20s who received AFDC as teenagers suggests that welfare receipt may indeed adversely affect the life chances of teenage recipients. Although our estimates are based on rather small samples, the considerable differences between the subsequent economic success of women who had received AFDC following a teenage birth and that of women who had not been AFDC recipients during their teenage years were usually highly significant in a statistical sense, and certainly large in a substantive sense. The introduction of extensive controls for family background and the economic accomplishments of siblings reduced but by no means eliminated these differences. When coupled with Ellwood's evidence on receiving AFDC over a long period, our results suggest that teenage recipients are indeed a vulnerable group upon whom greater policy attention should be focused.

Two kinds of policy options may be worth considering. A first set focuses on preventing teenage births. Sex education and family planning programs are key elements here, although it is difficult to point to many examples of programs that have proved their effectiveness.[11] If limited life options lead teenagers to have children because they have "nothing to lose" in doing so, there is an obvious role for programs that expand the employment opportunities of both teenage females and teenage males. A second set of policies might be directed at the teenage mothers themselves; the Family Support Act of 1988 took a step in this direction by identifying teenage mothers as a priority category for schooling and employment assistance.

Despite the highly significant differences found in our analysis, we view our evidence (and therefore any policy discussions flowing from them) as suggestive rather than conclusive, for a number of reasons. First, despite our extensive list of control variables, there may be further sources of heterogeneity between recipients and nonrecipients that could contaminate our estimates of the "pure" (i.e., causal) effect of welfare receipt. In particular, while family and neighborhood factors are probably handled well by the sibling and parental information, we lacked information on the talents and attitudes of the teenage mother herself. Second, our method of adjusting for as many differences between recipients and nonrecipients as possible and then attributing remaining differences to the welfare system needs to be supplemented by direct

(Continued on page 35)

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*In the two regressions involving dependent variables scaled in natural logarithm units, coefficients can be converted to express the proportionate regression-adjusted differences in family income between the given independent variable and the reference group (teenage mothers who did not receive AFDC). Coefficients of –0.25, –0.50, –0.75, –1.00 and –1.25 imply average incomes that are 78, 61, 47, 37 and 29 percent as high as those of the control group, respectively. In the AFDC logistic regression, positive coefficients can be converted to express the regression-adjusted probability of AFDC receipt at age 26 when compared with the control group's 16 percent receipt rate; coefficients of 0.5, 1.0, 1.5, 2.0 and 2.5 imply receipt rates of 24, 34, 46, 58 and 70 percent, respectively. The regression results for the logarithm of taxable income were sensitive to the treatment of very low values: The results shown in Table 2 are based on a truncation from below at $1,000 and are roughly consistent with regressions on an unlogged and untruncated version of taxable income. Lower truncation points with the logged version produced more negative coefficients on the AFDC-teenage receipt dummy variable.

†We would have liked to divide our AFDC recipient sample by school enrollment status at the time of pregnancy and shortly after the birth, but this was not possible with the PSID data. We did, however, explore the importance of completed schooling, marital status and number of births, all measured at age 25, by including them, along with all other control variables, in the overall regressions. The inclusion of such variables proved surprisingly unimportant: The coefficient of –0.73 in the regression of earned family income was reduced only to –0.64, and the coefficient of 2.23 in the regression of AFDC receipt at age 26 increased to 2.74. (However, in the latter regression, the standard error jumped appreciably, indicating considerable imprecision in its estimation.)

Helping Teenagers Postpone Sexual Involvement

By Marion Howard and Judith Blamey McCabe

Summary

In 1983, the Henry W. Grady Memorial Hospital in Atlanta began a family planning–based outreach program for eighth graders in a local school system. The program is led by older teenagers and focuses on helping students resist peer and social pressures to initiate sexual activity. Evaluation of the program, based on telephone interviews with 536 students from the hospital's low-income population, revealed that among students who had not had sexual intercourse, those who participated in the program were significantly more likely to continue to postpone sexual activity through the end of the ninth grade than were similar students who did not participate in the program. Because of their lower rate of sexual activity, program students also experienced comparatively fewer pregnancies than no-program students.

"By the end of eighth grade, students who had not participated in the program were as much as five times more likely to have begun having sex than were those who had had the program."

Introduction

Grady Memorial Hospital's first sex education program in the schools was begun in the mid-1970s and consisted of five classroom periods covering basic human sexuality and decision-making information.[1] The curriculum, which includes discussion of contraceptive methods, was developed by the Emory University School of Medicine/Grady Memorial Hospital Teen Services Program, a family planning program for students aged 16 and younger. Young people were encouraged to seek contraceptive counseling and services through this program and other community family planning agencies if they needed them. The curriculum was presented to all eighth grade students (13–14-year-olds) in a local school system by adult health educators, nurses and adolescent counselors from the Emory/Grady Teen Services Program.

Early evaluation of the program indicated that simply providing young teenagers with such information was not effective in changing sexual behavior. The young people who had the five classes of factual and decision-making education were not more likely to refrain from sexual intercourse than those who did not have the classes, nor were they more likely to use contraceptives or prevent pregnancy if they became sexually involved.[2]

In rethinking the educational outreach program, hospital staff reached several conclusions about how it should be revised. First, the staff considered research done on programs intended to reduce the incidence of other negative health behaviors (e.g., smoking, alcohol use and drug use) among young people. Many of these health education programs are knowledge-based: They assume that adolescents have sex, smoke, drink or use drugs because they lack knowledge about specific aspects of such behaviors and their harmful effects. They also assume that if young people are given factual knowledge—along with information about decision-making that will enable them to apply such knowledge—their attitudes and behaviors will change. Research has shown, however, that knowledge-based approaches (including those with decision-making components) are not particularly effective in reducing negative health behaviors among young people.[3]

The limitations of knowledge-based programs have been demonstrated in the field of sex education as well. Douglas Kirby[4] studied 10 exemplary knowledge-based sex education programs in the United States and found that although the young people in such programs learned a great deal, their knowledge gains did not lead to behavioral changes. Students exposed to such programs were not more likely to postpone sexual involvement nor were they more likely to use contraceptives when they became sexually active.

The Grady hospital staff also considered the need to make age-appropriate revisions to the program. Study of adolescent development shows that cognitive growth lags behind physical maturation. Until about the age of 16, adolescents are still using concrete thinking skills. As a result, young teenagers have limited ability to recognize the potential impact of their choices; they are less likely than older teenagers to think about the future and to consider the consequences of their actions.

These assessments correlate with Michael Young's secondary analysis of a 1986 Harris Poll commissioned by Planned Parenthood. Young showed that neither sex education nor knowledge are related to postponement of sexual intercourse or use of contraceptives among adolescents younger than 17: A knowledgeable 13-year-old is no more likely to use contraceptives than is an uninformed 13-year-old. Young concluded, "It may be . . . that developmentally, younger teen[ager]s are not able to effectively apply the knowledge that they have."[5] Thus, educational programs must be age-specific, promoting attitudes and skills that young adolescents can use until they gain more mature skills in managing their sexuality.

One of the more promising new educational models with respect to reducing negative health behaviors is known as the social influence or "social inoculation"

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model and is based on the concept that young people engage in such behaviors, including early sexual activity, partly because of societal influences, both in general and, more specifically, from their peers. The model uses the public health concept of immunization as a strategy for combating social and peer pressures that encourage negative health behaviors. By exposing young people to these "noxious" social influences in small doses, while at the same time enabling them to examine such influences and develop skills to deal with them, this strategy helps young people eventually build up an "immunity" to them. Programs based on this model rely on specific activities that help students identify the origins of pressures to use drugs, smoke, drink or have sex, to examine the motivations behind those pressures and to develop skills to respond effectively. This approach has yielded encouraging results: Interventions designed to prevent or reduce smoking have produced differences in rates of cigarette use among young people ranging from 25 to 66 percent, depending on the program.[6]

The social inoculation approach also uses role models—teenagers slightly older than those being given the program—to present factual information, identify pressures, role-play responses to pressures, teach assertiveness skills and discuss problem situations. Teenage leaders have been shown to produce greater and more lasting effects than adults.[7] Young people want to be and act older than they are. Besides imparting attitudes and skills, slightly older teenagers illustrate that those who "say no" to the pressured behavior can be admired and liked by others. They also clearly demonstrate to the younger teenagers that the behavior—for example, having sex—is not the way to attain such status.

The Revised Program

Based on these considerations, Grady Hospital revised its outreach program by creating a new component using the social influence model.[8] The program, called Postponing Sexual Involvement, was field-tested in Cleveland and Atlanta, and in 1983, the Ford Foundation provided funds for a large-scale implementation of the series in Atlanta schools. Postponing Sexual Involvement is an experiential program. Because young teenagers do not respond well to lectures, this series is designed to involve them in thinking about and discussing social and peer pressures to become sexually involved, and then practicing skills that will be helpful to them in resisting these pressures. Postponing Sexual Involvement is presented by older teenagers: Each session is generally led by one male and one female student from 11th or 12th grade. The student leaders are recruited, trained and supervised on-site in each classroom by the Emory/Grady Teen Services Program staff.

Because young people also need the detailed information about reproduction, family planning and sexually transmitted diseases contained in the original curriculum, Postponing Sexual Involvement was added to the existing program. The complete, 10-period program is presented each year to all eighth grade students in 19 separate schools—approximately 4,500 students each year.

Although one of the major *implicit* goals of the earlier program was to assist young people in postponing sexual involvement, that goal is made *explicit* in the revised outreach program. This approach was given support by a random sample survey of more than 1,000 sexually active girls aged 16 and younger seen in the Emory/Grady Teen Services Program clinic.[9] Of nearly two dozen items thought to be of interest, teenage girls were most likely to indicate that they wanted more information on "how to say 'no' without hurting the other person's feelings" (84 percent). Thus, the new program shows promise of meeting the needs of many young people, as well as those of the parents and the community.

The philosophy of Postponing Sexual Involvement is that:

- Persons younger than 16 are not able to fully understand the implications of their actions.
- Persons younger than 16 generally are not mature enough to deal with the consequences of their sexual actions. Furthermore, the needs that young people are trying to meet through sexual intercourse could best be met in other ways.
- Young people under 16 are often pressured into doing things they really do not want to do. Pressure to have sexual intercourse comes from peers and also from glamorous images presented by the media.
- Young people need awareness and skills to be able to resist pressure to become sexually involved. They need support and practice in learning how to resist this pressure.
- Young people respond most favorably to programs promoting postponement of sexual intercourse when the information about how and why to say "no" comes from peers slightly older than themselves.

The program primarily focuses on the social and peer pressures that lead young people into early sexual involvement and on ways to resist such pressures. The emphasis is on why young people are having sex and how they might avoid it, rather than on the consequences of such behavior. Examples of pressures from the media as well as scenes depicting problems young people face in relating to peers are presented in the videotape or slides that accompany the series. Although five classroom periods may not seem like much time, each session concentrates on variations of a single message—how and why to postpone sexual involvement. In addition, because the material is presented by older, socially successful students, this five-session series may exert a more powerful influence than would a longer series taught by adults. Generally the first four sessions are given fairly close together—four classroom periods in a week or one each week for four weeks. The fifth session reinforces program content and is best given 1–3 months later, after students have had time to think about the material.

To evaluate the revised program, a prospective study was designed to determine whether adding Postponing Sexual Involvement to the existing human sexuality program would reduce the rate of sexual involvement among young people. The assumption was that a reduction in the rate of sexual involvement also would reduce pregnancy rates.

The specific population used for the evaluation were low-income teenagers who were most likely to utilize Grady Memorial Hospital, a public facility, whenever they needed health care. Such teenagers are at high risk for early sexual involvement and poor pregnancy outcomes. Hospital birth records were used to identify male and female students entering eighth grade in 1983 who were born at the hospital and who had remained in poverty, as indicated by the fact that they or their mother had received care from the hospital within the last five years. It was anticipated that a portion of these young people would be students in the school system where Grady's outreach education program was being given, and that another portion would be attending other school systems, thereby forming a natural comparison group. The evaluation was part of a larger study of the health habits of eighth and ninth grade students. By using this broader approach, Grady staff were able to surround the questions relating to sexual behavior with those about eating habits, exercise and sleep habits, smoking, drinking, and drug use, so that the sexual behavior questions would not stand out.

The broad health information and the specific data needed to evaluate the program were collected through telephone interviews conducted at the beginning, middle and end of eighth grade—when the program was given—and at the beginning and end of ninth grade. Parental permission was sought for student participation in the study, and 99 percent of the parents contacted granted such permission. When sensitive questions were asked during the telephone interviews, students were given verbal codes to use in answering so that anyone within listening distance would not understand their responses. The telephone interviews were carried out through a subcontract with the Georgia State University Center for Public and Urban Research. At least 10 repeat phone calls were made to reach subjects.

Table 1. Percentage of students with various behavioral and background characteristics, by school program status

Characteristics	Program schools (N=395)	No program schools (N=141)
Is black	99	99
Lowest income categories (paid less than standard low-income fee at last hospital visit)	56	45*
Lives with two parents	36	57*
Gets mostly A or B grades in school	71	65
Plans more education after high school	86	87
Is involved in club, team or activity	53	52
Is leader in club, team or activity	20	16
Never says no when asked to do something don't want to do	13	8*
Has boy/girl friend	46	38
Thinks most/several friends have had sex	45	45
Thinks almost everybody/ a lot of 8th graders have sex	41	40
Thinks best friend has sex	44	50
Thinks friends would disapprove if had sex	44	36
Thinks parents would be very upset if had sex	73	73
Alone with someone who wanted sex last month	41	47
Thinks will have sex in next six months	21	23
Would find it hard to say no to sex with someone they care about	46	49
Has had sex	25	23
Has drunk	21	23
Has smoked	9	6
Gets eight hours' sleep each school night	81	83
Exercises strenuously 1/2 hour, three times/week	92	92
In good health	92	97
Eats fruits/vegetables every day	78	78

*$p<0.05$.

In addition to collecting data through these interviews, program personnel reviewed the medical records of the young women in both the program and no-program groups who had been seen in the hospital in the last five years. The review, conducted 10 months after the last interview, examined hospital records for information regarding sexual involvement, pregnancy tests, treatment of sexually transmitted diseases, family planning counseling and family planning services. The interview and hospital data were found to be remarkably consistent: Contradictions with interview data occurred in only one percent of the cases.

The data analysis focused on the behavioral outcomes of the study population. The key questions to be answered by the evaluation were: Would students who had not had sexual intercourse before they had the program postpone sexual involvement in the eighth grade? Would postponement continue through the ninth grade? Would both boys and girls postpone sexual involvement? Would students who began sexual intercourse after having the program report less frequent intercourse? Would girls who had the program have fewer pregnancies? Would students who had had sexual intercourse before the program change their behavior as a result of the program?

Results

The study population comprised 536 low-income minority students, 395 from the 24 program schools that received the outreach program in the 1984–1985 school year, and 141 students from 29 other schools in the local area. There were no statistically significant initial background differences that would bias any outcomes in favor of those who were to receive the program (Table 1).

To evaluate the effects of Postponing Sexual Involvement, students in program schools were divided into two groups: those who had not had sexual intercourse before the program, and those who had. Both of these target groups are contrasted and compared with the students who did not participate in the program. The percentage of students who reported having had sex at the beginning of the eighth grade was slightly higher in the program schools (25 vs. 23 percent). Boys in both groups of schools were much more likely to say that they had had sexual intercourse than were girls: Forty-four percent of all eighth grade boys interviewed said they had had sex, compared with just nine percent of eighth grade girls.

Of the 536 students who completed all five of the study's interviews, 131 (25 percent) reported that they had had sexual intercourse before their preprogram interview while 387 students (72 percent) said they had not yet had sexual intercourse. In addition, there were 18 students (three percent) in program schools for whom it could not be determined whether or not they had had sexual intercourse prior to the program. These students said they had not had sex when they were first interviewed but indicated at the end of the same semester in which they were given the Postponing Sexual Involvement program that they had had sex. It is not known whether they began having sex prior to the program, during the program or after the program. These 18 students are not included in the presentation of results, not only because their status is unclear, but also because the significant study findings remain even when these students are conservatively distributed among the preprogram and postprogram sexually involved groups.[10]

Of the 387 students who had not had sexual intercourse by the time of their preprogram interview, 278 attended schools in which Postponing Sexual Involvement was given, and 109 were in schools where the program was not offered. As Table 2 (page 24) shows, 256 of these 278 students in program schools actually attended the Postponing Sexual Involvement program. These students were significantly more likely to postpone sexual intercourse than were the 109 similar students in other schools who did not have the program. Indeed, by the end of eighth grade, students who had not had the program were as much as five times more likely to have begun having sex than were those who had had the program: 20 vs. four percent. The program also appeared to have a lasting effect. By the end of ninth grade, just 24 percent of the students who had participated in the program had begun having sex, compared with 39 percent of those who had not.

Not included in Table 2 are the 22 additional students who had not had sex and, for some reason, missed the program when it was offered in their schools. Although the number of such students is small, it is interesting to note that their rate of sexual

Table 2. Percentage of students who initiated sexual activity after eighth grade, by program status

Grade and gender	Program (N=256)	No program (N=109)
End of eighth		
Total (N=365)	4	20*
Boys (N=125)	8	29*
Girls (N=240)	1	15*
Beginning of ninth		
Total (N=365)	12	27*
Boys (N=125)	22	42**
Girls (N=240)	7	18**
End of ninth		
Total (N=365)	24	39*
Boys (N=125)	39	61**
Girls (N=240)	17	27**

*$p<0.01$ **$p<0.05$

involvement more nearly parallels that of the young people in schools where the program was not given than it does that of the young people in their own schools who attended program sessions. By the end of eighth grade, the students who had missed the program were as much as 4.5 times more likely to have begun having sex than were their fellow students (18 vs. four percent). By the end of ninth grade, these students still showed a higher rate of sexual involvement (36 vs. 24 percent). This supports the conclusion that the program itself, and not differences among schools, was responsible for the differences in student behavior.

The program had a pronounced effect on the behavior of both boys and girls who had not been sexually involved before the program, which included 91 percent of girls and 56 percent of boys interviewed at the beginning of eighth grade. As Table 2 shows, by the end of eighth grade, boys who had not had the program were more than three times as likely to have begun having sex as were boys who had had the program. (29 percent vs. eight percent). By the end of ninth grade, 61 percent of no-program boys had begun having sex, compared with 39 percent of program boys.

Postponing Sexual Involvement had an even more striking impact on girls who had not yet become sexually active. By the end of eighth grade, girls who had not had the program were as much as 15 times more likely to have begun having sex as were girls who had had the program (15 percent vs. one percent). By the end of ninth grade, 27 percent of no-program girls had begun having sex, compared with 17 percent of program girls.

To assess whether or not the students perceived Postponing Sexual Involvement as enabling them to have more control over their sexual behavior, they were asked: "With respect to the information the teen[age] leaders or person from Grady Hospital taught, how helpful will that information be to you personally in saying no to sex?" Of the young people who had not had sex before the program, 95 percent said the program would be helpful personally to them in saying no to sex, and more than 80 percent thought the program would be extremely helpful or very helpful. Overall, girls and boys were almost equally likely to say they thought the program would be helpful personally (92 percent of boys and 96 percent of girls). However, girls were more likely to rate the program as extremely helpful or very helpful.

In analyzing program outcomes, it was important to determine whether students who had had the program were less likely to have boyfriends or girlfriends and, therefore, whether some of the difference in rates of sexual involvement could be attributed to fewer relationships with the opposite sex. However, it appears that overall, those who had not had sex and who had participated in Postponing Sexual Involvement were just as likely, or more likely, to have boyfriends and girlfriends as those in the no-program group. At the beginning of eighth grade, 38 percent of program students and 31 percent of no-program students said they had a boyfriend or girlfriend, and the proportions evened out to slightly less than 50 percent for both groups through ninth grade. At the end of ninth grade, 50 percent of program students and 43 percent of no-program students said they had a girlfriend or boyfriend.

To determine how young people viewed their sexual involvement and what expectations they had for sexual involvement in the future, those who had become sexually involved after the program were asked three questions:

"Which of these statements best describes you now?—I have sex often, I have sex sometimes, I tried sex once or twice, I used to have sex but don't anymore or I never had sex."

"On how many days did you have sex in the last month?"

"Do you expect to have sex in the next six months?"

At the end of ninth grade, very few of either the program or no-program students who began having sex after the period in which the program was offered described their behavior as "used to have sex but don't any more" (eight percent and five percent, respectively). However, approximately 10 percent of the students in both the program and no-program groups who had indicated that they had had sex some time after the program, said at the end of ninth grade that they had never had sex.

Of all students who had acknowledged having had sex after the program was offered, many more of the no-program group described themselves at the end of ninth grade as having sex "often" or "sometimes" in contrast to the program group (55 vs. 39 percent). Students in the program group appeared more likely only to have experimented with sex: They described themselves much more often than the no-program group as "having tried sex just once or twice" (43 vs. 28 percent). Although Postponing Sexual Involvement discourages experimentation with sex, it also makes the point that just because a person has had sex, it does not mean that he or she has to continue to be sexually active.

In contrast to these findings, among those who had become sexually involved, more no-program students reported at the end of ninth grade that they had not had sex in the last month than did program students (43 vs. 34 percent). This difference was almost entirely among the boys: Forty-four percent of no-program boys said they had not had sex in the last month compared with only 24 percent of program boys. Among girls, however, similar proportions (42 percent of no-program girls and 46 percent of program girls) reported that they had not had sex in the last month. At the end of ninth grade, young people who had had the program and had become sexually involved were more likely to say they did not expect to have sex in the next six months than were those who did not have the program. (This attitudinal measure, taken at each interview, was not a good predictor of actual behavior, however.)

Among students who had not had sex before the program began but did have sex after that time, many did use contraceptives—nearly half in the program group and close to one-third in the no-program group. Not only did more program than no-program students use contraceptives, but 73 percent of the program students who used them said they did so because of what they had learned in school. In the no-program group, only 38 percent said they used birth control because of what they had learned in their schools.

Hospital medical records were used, in addition to the interview statements, to determine the incidence of pregnancy among young women who, at the beginning of the program, had not yet had sexual intercourse. Because of the small sample size, a true determination of any reduction in pregnancies is impossible, since pregnancy rates are usually calculated per 1,000 women. Therefore this information must be viewed with extreme caution.

Proportionally fewer program girls became sexually involved, resulting in proportionally fewer girls at risk for pregnancy: Among the 168 girls who had not had sexual intercourse before the Postponing Sexual Involvement program, 28 (17 percent) became sexually active and experienced five pregnancies (18 percent) by the end of ninth grade. Of the 70 comparable no-program girls, 19 (27 percent) became sexually active and experienced three pregnancies (16 percent). If program girls had become sexually active at the same rate as no-program girls and had retained their 18 percent pregnancy rate, they would have experienced eight pregnancies rather than five. Consequently, the program appears to have reduced pregnancies by one-third. However, girls from both groups who became sexually involved had similar pregnancy rates. This finding corroborates previous data suggesting that the provision of human sexuality and family planning information may be necessary but is not sufficient to help many sexually involved young people avoid pregnancies.

Based on the information given by the students throughout the five interviews, 131 of the 536 students (25 percent) had had sexual intercourse by the time of their pre-program interview. Of these, 99 were in program schools (four of these students missed the program when it was offered) and 32 were in no-program schools. The evidence suggests that although Postponing Sexual Involvement was effective for young people who had not yet had sex at the time they were given the program, it was not effective for those who had already become sexually involved. Students who had had sexual intercourse prior to the program did not change their behaviors (i.e., reduce sexual involvement or increase use of contraceptives) as a result of the program. Furthermore, girls who had had sex before the program were not more likely to have fewer pregnancies than were similar students who were not given the program.

Discussion

The major goal of Grady Memorial Hospital's Postponing Sexual Involvement program given in eighth grade was to assist young people in postponing sexual intercourse. Overall, nearly three-quarters of the students in the program group had not had sexual intercourse before participating in the program. Based on the reports of these students, the study found that almost all (95 percent) who had not had sexual intercourse and who participated in the hospital's program felt the information personally would be helpful in saying no to sexual involvement. In fact, those who had the program did delay sexual involvement. By the end of eighth grade, students who had not participated in the program were as much as five times more likely to have begun having sex than were those who had had the program. Program students were also more likely to continue to postpone sexual involvement: By the end of ninth grade, 24 percent of the students who were participants in the program had begun having sex, compared with 39 percent of those who were not. The program appeared to help both boys and girls to postpone sexual activity.

The study also found that students who began having sexual intercourse after participating in the Postponing Sexual Involvement program reported less sexual involvement at the end of ninth grade than those who had not had the program. There were also proportionally fewer pregnancies among the program group because there were fewer girls who were sexually involved.

However, the program did not influence the sexual behavior of students who had had sex before particpating in the program. These students were neither more likely to reduce sexual involvement nor more likely to use contraceptives (or to have fewer pregnancies) than were similar students who had not particiapted in the program.

The reduction in sexual involvement and pregnancies experienced by the study group cannot be generalized to the broader group of more than 4,000 other eighth graders who had Postponing Sexual Involvement at the same time. Because of their low-income status, the students in this study are assumed to be among the highest risk students for sexual involvement and pregnancy in the school system in which the program was given. On the other hand, because of the students' high-risk status, the findings are promising indicators that Postponing Sexual Involvement can reduce pregnancy rates by reducing sexual involvement among young high-risk teenagers.

Some parents and educators have wondered whether giving young people information about contraceptives along with support for postponing sexual involvement is too confusing a message. Our data suggest that the two messages are not incompatible. Young people who received instruction from family planning counselors about human sexuality, including family planning, and advice from student leaders about postponing sexual involvement used information from each component of the program. Students involved in the program were more likely both to postpone sexual involvement and to use contraceptives when they did have sex than were the no-program group. However, the majority of young people in both the program and no-program groups who did have sex did not use contraceptives.

Further issues remain to be investigated. Would Postponing Sexual Involvement be as effective with other population groups as it was with this low-income high-risk group? Would it be as effective when led by adults instead of teenage leaders? Would the Postponing Sexual Involvement component given by itself, without a complementary human sexuality education program, be as effective?

The most demanding aspect of implementing the new program has been the time and effort needed to recruit and train the student leaders. They each receive 20 hours of initial training followed once a month by two-hour in-service training sessions to improve skills and reinforce program goals and objectives. Since most are 12th graders, new leaders have to be hired and trained each year. After the first year, however, student leaders helped in the recruitment process by recommending 10th or 11th graders they felt would make good presenters, based on their experience with the program. Another unanticipated source of good candidates was the first eighth grade class to have the program; some of these students were so impressed with the student leaders that they wanted to become leaders themselves when they reached 11th grade.

After potential leaders are chosen, the hospital staff has the responsibility of explaining the teenage leader role to each student's parents and obtaining parental permission. A more time-consuming task each year has been helping student leaders explain their new responsibilities to teachers or principals who previously have not been involved with the program. This problem has been resolved to some degree by a clarifying memorandum from the school administration to all principals and teachers, indicating that the students' absences are to be excused, but that students are responsible for making up all missed school work according to each teacher's specifications. Nevertheless, orientation of new high school personnel continues to require extra staff time.

The most difficult aspect of using student leaders is their scheduling and transportation. For every session offered in a middle school, teenage leaders have to be contacted and arrangements made for their transportation between schools. The few student leaders who can drive and have access to cars help ease the situation somewhat, as does the availability of leaders in the few high schools that include eighth graders. However, most leaders cannot miss more than a few classes, so when sessions are scheduled all day, it is often necessary for program staff to pick up a second set of leaders to finish the sessions. In addition, since student leaders are paid for each presentation and for their once-a-month mandatory in-service training, the staff must keep accurate records of these assignments and hours and arrange for payment.

Despite these complicating factors, the program staff believes that the student leaders are extremely important, because they make the program more interesting and acceptable to the younger students. Current leaders who had the program as eighth graders say that it was the enthusiasm of the student leaders that drew them into active participation in the program and helped them seriously consider the messages being given.

One unanticipated positive outcome of using student leaders is the benefit to the leaders themselves. The program enables them to gain confidence, improve their presentation skills and become more articulate. For some, it has been their first experience in helping others in an organized way, and they enjoy the recognition and respect of the younger students. A few student leaders say the experience has been influential in their decision to become teachers.

Based on our experience in providing eighth grade students with support for postponing sexual involvement as well as acquainting them with methods of birth control and how to use them, we have expanded the hospital's outreach program in two directions. We have developed a program for fifth and sixth graders aimed at helping them handle their curiosity about sexual involvement and develop attitudes and skills to manage sexual behaviors as they become young teenagers.[11] The other effort is a follow-through program aimed at reinforcing for ninth and 10th graders the information and skills they learned in eighth grade.[12] The program staff hopes that this continuum of consistent educational messages combined with repetitive skill-building will increase the effectiveness of the hospital's outreach program.

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Research Note

Teenage Pregnancy in Canada, 1975–1987

By Surinder Wadhera and John Silins

Introduction

Culturally, Canada is composed of two nations—the predominantly francophone province of Quebec and the anglophone provinces whose culture is similar to that of the United States. In Canada, racial minority groups make up a very small proportion of the total population. (In 1971, American Indians and Eskimos constituted less than two percent of the population, Asians made up only 1.3 percent and blacks and West Indians, just 0.3 percent.[1])

The recent fertility history of Canada parallels that of its southern neighbor, the United States. After World War II, the countries experienced a baby boom that peaked at roughly the same time,[2] with fertility reaching its highest postwar level in 1959 in both.[3] In 1986, the total fertility rate (TFR) in Canada was 1.67 children per woman, slightly lower than the U.S. TFR of 1.84.

This research note focuses on fertility among Canadian teenagers. We report the numbers of pregnancies and the pregnancy rates per 1,000 15–19-year-old women from 1975 to 1987. Also included is a discussion of trends, age differentials, pregnancy outcomes and regional variations in rates.

Sources and Methodology

In our calculation of teenage pregnancies, we have included the following: registered live births; therapeutic abortions (induced abortions) performed in accredited and approved hospitals in accordance with the abortion law amended in 1969;* and other pregnancy terminations including fetal deaths occurring after 20 weeks' gestation, hospitalized cases of spontaneous abortion, and "other" and unspecified abortions. (The hospitalized cases include those taking place elsewhere that were admitted for treatment.)

Data on abortions performed in hospitals were available according to the calendar year for 1975–1978 and according to the fiscal year for 1979–1984. Because data were not available for 1985–1987, we assumed that the calendar-year and fiscal-year abortion data are comparable and then extrapolated the number of abortions performed in hospitals for that period by applying the three-year average increase occurring between 1981 and 1984 to the 1984 figures.

We define the teenage pregnancy rate as the number of pregnancies per 1,000 women who were 15–19-years old at the time of the pregnancy's outcome rather than at its conception. The national and regional data used in this paper were extracted from reports published by Statistics Canada on population, births, therapeutic abortions and hospital morbidity.[4] These data are provided to Statistics Canada by the provinces and territories. No data are included from the province of Newfoundland because data on births were not available by mother's age. (In 1987, Newfoundland accounted for 2.3 percent of Canada's total population of approximately 26 million, for 2.1 percent of the live births occurring annually, and for 0.7 percent of the number of therapeutic [induced] abortions performed annually in the country.)

As no data are available at the national level from Statistics Canada on induced abortions performed in clinics or on spontaneous abortions not requiring hospitalization, these are not included in our analysis. Our estimates also exclude data on abortions obtained by Canadians outside the country. Including those abortions obtained in the United States in our calculations would have raised the pregnancy rates somewhat for several provinces.

National and Provincial Data

Both the number and the rate of pregnancies among teenagers in Canada declined each year from 1975 through 1987 (Table 1, page 28). For example, in 1987 there were 36,694 pregnancies to 15–19-year-old women—26 percent fewer than the 49,825 pregnancies recorded in 1981 and 37 percent fewer than the 58,610 pregnancies registered in 1975. Similarly, the pregnancy rate in 1987 among women in that age-group was 11 percent lower than that for 1981 (41 per 1,000 women aged 15–19, compared with 46 per 1,000), and 24 percent lower than that for 1975 (53 per 1,000 women 15–19).

During the period 1981–1987, the number of pregnancies to teenagers declined by an average of 4.4 percent annually, almost twice the average annual decline of 2.5 percent registered during 1975–1981. Furthermore, the rate of teenage pregnancy declined annually by an average of 1.9 percent during the period 1981–1987 and by an average of 2.4 percent during 1975–1981. (If we apply the 1987 rate of 41 pregnancies per 1,000 teenage women to the 1975 population, 14,000 fewer teenage pregnancies would have taken place than the actual number recorded in 1975.)

In 1987, approximately 40 percent of the 903,000 women in the 15–19 age-group

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*Therapeutic abortions are induced abortions that have been performed in accredited and approved hospitals in Canada as authorized by the 1969 amendment to the Criminal Code. The revised law permitted pregnancy termination in hospitals only and required that a hospital committee of at least three physicians certify that the abortion was necessary to preserve the women's life or health. The situation in Quebec, however, was very different—that province allowed abortions to be performed in clinics without committee authorization.

Table 1. Number of women aged 15–19, number of pregnancies among women aged 15–19 and age-specific pregnancy rates (per 1,000 women), by year, Canada

Year	Population (in 000s)	Number of pregnancies	Pregnancy rate		
			15–19	15–17	18–19
1975	1,098	58,610	53.4	34.1	83.3
1976	1,119	58,315	52.1	32.8	82.0
1977	1,127	57,594	51.1	32.4	79.8
1978	1,135	56,816	50.1	31.5	77.8
1979	1,134	53,886	47.5	30.1	73.2
1980	1,122	52,895	47.1	28.8	69.4
1981	1,090	49,825	45.7	28.8	69.4
1982	1,065	48,043	45.1	28.3	67.4
1983	1,018	42,626	41.9	26.2	62.0
1984	971	40,108	41.3	25.7	61.6
1985	933	37,693	40.4	24.8	62.0
1986	915	37,529	41.0	25.5	63.7
1987	903	36,694	40.6	24.9	64.3

Note: In this and the following table, data for the province of Newfoundland are not included.

were 18–19 years old. These older teenagers contributed 63 percent of the nation's 36,694 pregnancies to teenagers that year, 68 percent of the 20,981 live births to teenagers and 58 percent of the 13,501 induced abortions among teenagers. In 1987, the pregnancy rate among 18–19-year-olds (64 per 1,000 women 18–19) was two and one-half times that of 15–17-year-olds (25 per 1,000 women 15–17). During 1975–1987, the average decline in the annual pregnancy rate among 18–19-year-olds was slightly less than the average decline among 15–17-year-olds (1.9 percent compared with 2.2 percent).

As the data in Table 2 indicate, 57 percent of pregnancies among teenagers in 1987 resulted in a live birth, 37 percent ended in an induced abortion and the remaining six percent, in fetal death or some other pregnancy termination. While the number of pregnancies among 15–19-year-olds decreased by 37 percent between 1975 and 1987, the number of live births among women 15–19 decreased by 46 percent during that period (from 38,818 in 1975 to 20,981 in 1987). Induced abortions followed a different pattern; their annual number increased steadily, from 14,716 in 1975 to a peak of 18,739 in 1979 (not shown). The number of procedures then dropped in each of the following years so that by 1987, 13,501 induced abortions were performed among Canadian teenagers, even fewer than in 1975.

As mentioned earlier, the Canadian baby boom peaked in 1959.[5] The fertility rate among 15–19-year-olds decreased from a high of 60 births per 1,000 women in that year to 35 per 1,000 in 1975, a decline of 41 percent. During the next 12 years, it declined by another 36 percent to reach 23 per 1,000 by 1987. The average annual fertility rate for 18–19-year-old women was three times that for 15–17-year-olds during the 1975–1987 period. The fertility rate for the older women declined by an average of 2.8 percent annually and the rate for the younger teenagers, by 3.1 percent annually over the 12 years.

The rate of induced abortion per 1,000 15–19-year-olds increased by 24 percent over the five-year period 1975–1980 (from 13 abortions per 1,000 teenagers to 17 per 1,000). It then decreased during each of the following five years (to 14 per 1,000 in 1985), before rising again slightly to 15 abortions per 1,000 teenagers in 1987. During 1980–1987, the average annual decline in the rate of induced abortion for 15–17-year-olds was more than three times the decline for 18–19-year-olds (1.8 percent vs. 0.5 percent), and by 1987, the induced abortion rate among 18–19-year-old women was twice the rate for 15–17-year-olds.

As previously stated, the category of "other" pregnancy outcomes includes fetal deaths after 20 weeks' gestation and hospitalized cases of spontaneous abortions and other unspecified abortions. Both the numbers and rates of these other outcomes among pregnant teenagers declined by about half during the study period—the number fell by 56 percent and the corresponding rate, by 48 percent.

The teenage pregnancy rates during the period under examination were generally higher in the Western provinces than in the Eastern provinces (with the exception of Newfoundland, for which no age-specific data were available), and ranged from a low of 26 pregnancies per 1,000 teenage women in Quebec to a high of 60 per 1,000 in Manitoba (Figure 1). Moreover, from 1975 to 1987, teenage pregnancy rates declined by six percent in Manitoba; by 20–35 percent in Saskatchewan, Alberta, British Columbia, Ontario and Nova Scotia; by 44 percent in Prince Edward Island; and by 52 percent in New Brunswick (not shown). In Quebec, however, the pregnancy rate per 1,000 15–19-year-olds increased by six percent.

In 1987, as in prior years, the proportion of teenage pregnancies resulting in births was greater for Prince Edward Island (92 percent), New Brunswick (82 percent) and

Table 2. Number of pregnancies and age-specific pregnancy rates (per 1,000 women), by age-group, according to pregnancy outcome and year

Outcome and year	Number			Rate		
	15–19	15–17	18–19	15–19	15–17	18–19
All pregnancies						
1975	58,610	22,687	35,923	53.4	34.1	83.3
1981	49,825	18,267	31,558	45.7	28.8	69.4
1987	36,694	13,489	23,205	40.6	24.9	64.3
Births						
1975	38,818	13,190	25,628	35.4	19.8	59.4
1981	29,062	9,107	18,955	26.7	14.3	43.9
1987	20,981	6,790	14,191	23.2	12.5	39.3
Abortions						
1975	14,716	7,371	7,345	13.4	11.1	17.0
1981	17,575	7,841	9,734	16.1	12.3	21.4
1987	13,501	5,674	7,827	14.9	10.5	21.7
Other*						
1975	5,076	2,126	2,950	4.6	3.1	6.9
1981	3,188	1,319	1,869	2.9	2.0	3.7
1987	2,212	1,025	1,187	2.5	1.9	3.3

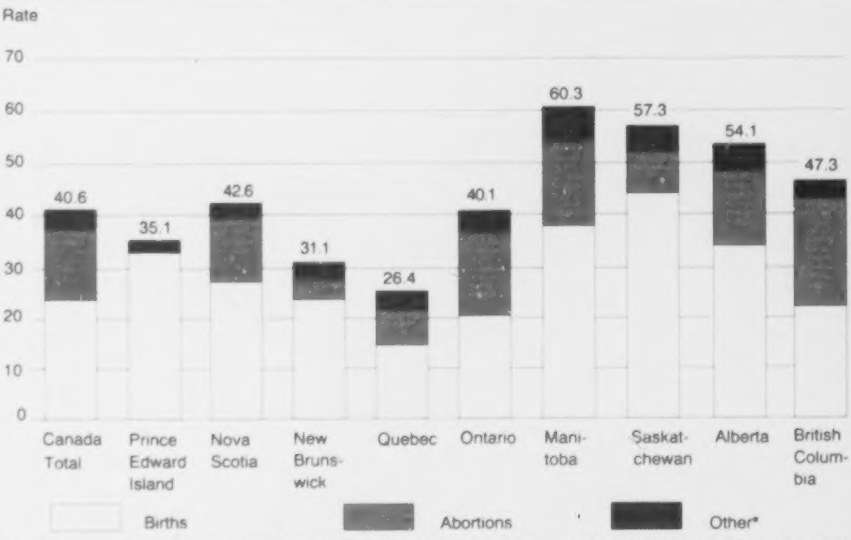
*Includes fetal deaths of at least 20 weeks' gestation, hospitalized cases of spontaneous abortion and other unspecified abortions.

Saskatchewan (78 percent) than for Alberta (64 percent), Manitoba (63 percent), Nova Scotia (63 percent), Quebec (60 percent), British Columbia (45 percent) or Ontario (50 percent). Conversely, the proportion of pregnancies terminated by induced abortion was less than one percent for Prince Edward Island; less than 10 percent for New Brunswick; 10—35 percent for Saskatchewan, Alberta, Manitoba, Nova Scotia and Quebec; and 45–50 percent for Ontario and British Columbia.

Because there are very few cases recorded for the Atlantic Provinces—especially of induced abortions and "other" pregnancy outcomes—the rates and numbers should be interpreted with caution. The induced abortion rates are, to a great extent, a reflection of the availability and accessibility of abortion services. The abortion rates for provinces east of Ontario are lower than the national rate while rates in the provinces west of Ontario are higher. If it were possible to include those abortions obtained either outside of Canada or in Quebec clinics in calculations of abortion rates for the women's province of residence, the rates for the eastern provinces would be higher than those published by Statistics Canada. The high fertility rates in the Atlantic provinces, Manitoba, Saskatchewan and Alberta, may be partially explained by the social and religious composition of the population in those provinces.

Our estimate of a 24 percent drop in the teenage pregnancy rate in Canada from 1975 to 1987 is supported by other research. Maureen Orton and Ellen Rosenblat, for example, calculated a pregnancy rate of 44 pregnancies per 1,000 teenage women in 1981, which represented a decline of more than 10 percent from 49 per 1,000 registered in 1976.[6] Furthermore, Elise Jones and colleagues noted a national rate of 44 per 1,000 for 1981 (a decline of 13 percent from about 51 per 1,000 in 1971).[7] Our data indicate a 1981 teenage pregnancy rate in Canada of 46 per 1,000, a decrease of 14 percent from 53 per 1,000 in 1975. However, these teenage pregnancy rates were calculated on a slightly different basis: While our calculation took into account stillbirths of at least 20 weeks' gestation and hospitalized cases of spontaneous abortion and other unspecified abortions, the other two studies did not. Moreover, the other studies included induced abortions performed in Quebec clinics and legal abortions obtained by Canadian women visiting the United States, information not included in our investigation.

Figure 1. Pregnancy rates per 1,000 women aged 15–19, by province, according to outcome, 1987



*Includes fetal deaths of at least 20 weeks' gestation, hospitalized cases of spontaneous abortion and other unspecified abortions.

The addition of these clinic abortions and those performed out of the country would clearly raise the number and rates of teenage pregnancy in Canada. Based on incomplete reports from several U.S. states, most along the Canadian border, an average of 3,000 Canadian women obtained legal abortions in the United States each year from 1975 to 1987.[8] An estimated 22 percent of these were obtained by teenagers, which would increase the pregnancy rate for Canadian teenagers by 1.3 percent for the period. If we were to add the number of induced abortions performed in Quebec clinics[9] to our calculation, assuming that the two sets of data have identical age distributions, the average annual number of teenage pregnancies would increase by 10 percent for the province of Quebec and by 1.4 percent for Canada as a whole. The inclusion of Quebec clinic data would thus raise the average teenage pregnancy rate for Quebec from 24 pregnancies per 1,000 teenagers to 27 per 1,000.

The available data indicate that teenage fertility is much lower in Canada than in the United States. There were 40 pregnancies for every 1,000 Canadian women aged 15–19 in 1983, compared with 110 pregnancies per 1,000 women aged 15–19 in the United States.[10] In that year, the fertility rate among Canadian teenagers (24 births per 1,000 women aged 15–19) was less than half that of teenage women in the United States (52 per 1,000). The difference between the two countries in the legal abortion rate among teenagers is slightly greater than the difference in fertility rates—in 1985, the abortion rate among Canadian teenagers was 14 per 1,000, one-third of the 44 per 1,000 in the United States.[11]

For further international comparison, we derived teenage pregnancy rates for a group of selected countries* by adding the teenage fertility rates to legal abortion rates. We selected countries based on their similarity to Canada in general cultural norms and in level of economic development, as well as on the availability of recent reliable birth and abortion data.[12]

The 1983 teenage pregnancy rate for Canada (39 pregnancies per 1,000 women aged 15–19) was very close to the rate for Norway in the same year (41 per 1,000). Canada's 1983 rate was 12 percent less than that for England and Wales (45 per 1,000), 39 percent lower than the 1982 rate for Czechoslovakia (65 per 1,000) and about 60 percent less than the 1982 rate for the United States (97 per 1,000). However, the Canadian rate was somewhat higher than the 1983 rates for Sweden (30 per 1,000) and Finland (33 per 1,000). In a comparison of fertility rates, Canada's rate of 25 live births per 1,000 15–19-year-old women is very close to the rate for England and Wales (27 births per 1,000), and is roughly one-half the rates for Czechoslovakia (51 per 1,000), the United States (53 per 1,000) and Hungary (54 per 1,000). Only two of the selected countries—Czechoslovakia and the Netherlands—had a lower legal abortion rate for 1983 than Canada (14 abortions per 1,000 teenagers).

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*Czechoslovakia, England and Wales, Finland, Hungary, the Netherlands, Norway, Sweden and the United States.

Discussion

Rates of fertility and induced abortion are influenced to a great extent by changes in such factors as marital patterns, availability and access to abortion facilities, sexual behavior, and knowledge and use of contraceptives. For example, marital patterns in Canada have changed considerably over the past few decades: Both the annual number and the rate of all marriages have declined, and the marriage rate among teenage women has decreased by 79 percent in the 15-year period from 1972 to 1987—from 58 marriages per 1,000 unmarried women aged 15–19 to 12 per 1,000. The median age at first marriage for women rose by three years from 21.3 in 1972 to 24.3 in 1987. The significant declines in both the number and rate of marriages in Canada and the increase in the median age at first marriage tend to slow the pace of fertility.

To some extent, the decline in the teenage fertility rate paralleled the decline in the general fertility rate. Both rates increased appreciably during the baby boom of the 1950s and then declined in the following three decades. By 1987, the teenage fertility rate had fallen by 62 percent from its peak in 1959 and the general fertility rate had fallen by 55 percent. This drop in the teenage fertility rate may be attributed, in part, to recent trends of delayed marriage and family formation: By 1987, the median age at first birth rose by 3.7 years to 25.8 years from 22.1 years in 1965. As a proportion of all births, births to teenagers decreased to six percent in 1987 from 10 percent in 1965, while the proportion of births to women aged 20–29 increased to 63 percent in 1987 from 58 percent in 1965.

The declines in teenage pregnancy rates could better be explained if there were trend data of both sexual and contraceptive behavior. However, only limited data are available. According to the 1976 National Population Survey conducted by the Badgely Committee,[13] for example, only eight percent of 15-year-old women had had coitus, with an increase to 19 percent among those 16–17 years of age and to 60 percent among women 18–23 years of age. Furthermore, data from the 1978–1979 Canada Health Survey indicate that 17 percent of the 1.1 million Canadian teenage women were using oral contraceptives.[14] And results from the 1985 Canadian Fertility Survey show that 50 percent of 18–19-year-old women use a contraceptive method, with the pill accounting for more than 80 percent of use in this age-group.[15] Studies conducted in some Ontario counties between 1976 and 1981 have indicated that the provision of sex education and clinic contraceptive services have resulted in considerable declines in adolescent pregnancy.[16] Similar data for future years would be a definite asset to the study of teenage pregnancy in Canada.

In conclusion, there were 36,694 pregnancies in 1987 to Canadian women aged 15–19, a figure that represents a decline of 37 percent from the 58,610 pregnancies recorded in 1975. During the 12-year period, the rate of teenage pregnancies in Canada declined by 24 percent, so that 41 out of every 1,000 teenage women in Canada conceived in 1987 compared with 53 of every 1,000 in 1975. Fifty-seven percent of pregnancies to teenagers in 1987 resulted in a live birth, 37 percent in an induced abortion and the remaining six percent in some other abortion or in fetal death occurring after 20 weeks' gestation.

The decrease in the overall annual numbers and rates of teenage pregnancies and births may be attributable to delays in age at marriage and family formation; a decline in the proportion of teenagers in the female population over the last three decades; wider availability of contraceptives and the increased prevalence of their use; the impact of negative coverage of high rates of teenage pregnancy in the media; possible infertility resulting from sexually transmitted diseases among teenagers; higher rates and availability of abortion; and a greater emphasis on sex education and the prevention of unwanted pregnancy. However, the association between many of these factors and declines in teenage fertility rates has yet to be thoroughly documented.

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Special Report

Prenatal Care in the United States: Reports Call for Improvements in Quality and Accessibility

By Martha B. Witwer

Although most women in the United States receive adequate prenatal care services throughout their pregnancies, many women who are younger than 20, poor, undereducated, black or Hispanic do not, according to a 1989 report by The Alan Guttmacher Institute (AGI). Nationally, 16 percent of all pregnant women (585,000 each year) receive inadequate prenatal care; that is, they either begin care in the fifth month of pregnancy or later, or begin earlier but make fewer than half the number of visits recommended by the American College of Obstetricians and Gynecologists (ACOG). Another 18 percent of pregnant women (661,000 each year) receive intermediate care; they initiate care in the first four months, but make only 50–79 percent of the recommended number of visits.[1]

The U.S. Public Health Service Expert Panel on the Content of Prenatal Care concludes in its 1989 report that since women who receive prenatal care during their first trimester have better pregnancy outcomes than women who have little or no care, greater effort should be made to reduce medical and psychosocial risks early in pregnancy. In addition, the content and frequency of visits should be based on continuing risk assessment of each woman and fetus. The report notes that although maternal morbidity and mortality have greatly decreased during the last 30 years, the steady improvements in infant health have been less dramatic. Worldwide, the United States ranks 17th in infant mortality (10.4 deaths per 1,000 live births in 1986), even though it spends a higher portion of its gross national product (11 percent in 1986) on health care than any other country.[2] The report also points out the wide disparity in risk according to race: Compared with whites, blacks are at roughly twice the risk of low birth weight, preterm birth and infant mortality.

The AGI data suggest that women most in need of adequate care are least likely to receive it, because of low income, lack of insurance, limited access to care or social reasons. National data indicate that poor women are clearly less likely than those with higher incomes to obtain adequate care. In addition, women who are young, unmarried, black, Hispanic or Native American, or who have completed less than 12 years of education are less likely to obtain adequate prenatal care than those who are older, married, white or Asian and better educated. Recent expansion of Medicaid coverage for pregnant women may help reduce these differentials (some states now extend eligibility to those with incomes of up to 185 percent of the poverty level), but serious gaps exist in the provision of prenatal care.

In 1980, the U.S. surgeon general issued goals for 1990 that included the following: that in any county or racial or ethnic group, at least 90 percent of women should obtain prenatal care during the first trimester of pregnancy, and that nationally, no more than five percent of all newborns should weigh less than 2,500 g.[3] Halfway through the decade, however, the goal regarding prenatal care had been met in only one percent of counties, and the goal regarding low birth weight, in just 23 percent. In 1984–1986, 24 percent of U.S. births were to women who either received no care or began care after their third month of pregnancy, and 24 percent were to women who made fewer than nine visits for prenatal care. About seven percent of all U.S. babies were underweight at birth.

The traditional objective of prenatal care is to protect the health and well-being of the pregnant woman and her infant throughout pregnancy and the neonatal period. Providers have focused on managing the risks of pregnancy and on offering appropriate medical interventions for the woman, fetus and newborn. As in other areas of medicine, however, there is a new emphasis in prenatal care on health promotion, and on prevention of disease rather than on treatment. This approach recognizes that adverse pregnancy outcomes can be greatly reduced by promoting physical and psychological health before conception, and infant welfare can be enhanced by extending care beyond the neonatal period through the first year. Consequently, the Public Health Service panel concludes that "the content of prenatal care should include all necessary psychological, social, educational and general medical assessments and interventions," and lists specific objectives for the pregnant woman, the infant and the family.

Timing and Content of Care

According to the ACOG, a woman should have 13 medical visits during a normal, full-term pregnancy: the initial visit during the first six weeks of gestation, dated from the first day of the woman's last menstrual period (LMP); monthly visits through the sixth month; two visits each during the seventh and eighth months; and weekly visits until the time of delivery.[4]

The Public Health Service panel's report represents a departure from these recommendations by calling for proportionally more visits early in pregnancy and fewer total visits for healthy women (nine for nulliparous women and seven for parous women). However, the panel notes that the frequency and content of prenatal visits should be determined by the risk status of each pregnant woman and fetus, which is established before or soon after conception and is monitored routinely thereafter. The panel suggests that certain high-risk pregnant women may benefit from home visits, made by public health or visiting

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nurses, social workers or other providers.

The Public Health Service report also calls for the inclusion of a preconception visit within prenatal care. Ideally, many medical conditions, personal behaviors and environmental hazards associated with poor pregnancy outcomes could be identified and changed or treated before conception occurs. Thus, according to the panel, every woman contemplating pregnancy within one year (and her partner) should consult a prenatal care provider. Preconception risk assessment and counseling should be made available through primary care and family planning clinics, and should be recognized as part of prenatal care, with reimbursement and coverage included in all health insurance plans.

The report notes that preconception care would include the same components as prenatal care: risk assessment, health promotion, intervention and follow-up. The medical history, which is part of risk assessment, should include questions on psychosocial as well as medical factors. Among the latter are socioeconomic, demographic and nutrition status; family and genetic history; menstrual history; sexual and contraceptive history; obstetric history; and medical, surgical and infection history. In addition, data should be collected on housing and finances, exposure to teratogens, smoking, drug use and several items considered by the panel to be of high research priority: alcohol use, social support, stress, physical abuse, mental status, pregnancy readiness and extremes of physical work, exercise and other activity. Preconception risk assessment also involves a general physical examination and a number of required, as well as optional, laboratory tests.

Health promotion activities to reduce psychosocial risks may include counseling and referral to treatment programs for smoking and alcohol or other drug use, nutrition counseling and vitamin and iron supplementation, counseling on safer sex practices and avoidance of teratogens, and preparation for diagnostic tests. Providers may also need to arrange for home visits during the pregnancy; make referrals to home health agencies, community mental health centers or safe shelters; or arrange for social support, housing or medical assistance.

According to the panel's report, the first prenatal care visit should occur 6–8 weeks after LMP for both parous and nulliparous women. If a preconception visit has occurred, many of the medical history, physical examination and laboratory components of risk assessment will not need to be repeated. General health promotion topics should include nutrition, smoking and alcohol avoidance, physiological and emotional changes in pregnancy, sexuality, fetal growth and development and self-help strategies for discomforts. The frequency and content of future visits depends on the specific needs of the pregnant woman and her family, and appropriate intervention should be used to address identified medical or psychosocial risks. In the absence of such risk factors, revisits should involve continuing risk assessment and health promotion counseling appropriate for each stage of pregnancy.

For nulliparous women, the second visit should occur within four weeks; parous women may be contacted by phone at this time. The visit (or contact) should include a review of laboratory test results and additional health promotion issues such as maternal seat belt use, work patterns, exercise, sleep patterns, proposed prenatal care and the need to report danger signs. The third visit for nulliparous women (the second for parous women) should be made at 14–16 weeks' gestation. Risk assessment should include questions about nausea or vomiting, vaginal bleeding and fetal movement, as well as about maternal anxiety, social support and health behaviors. Health promotion should include discussion of fetal growth and development and the signs and symptoms of preterm labor. The fourth visit (the third for parous women) should occur at 24–28 weeks' gestation. Breastfeeding should be promoted and a partial history should include information about fetal movement, symptoms of preterm labor, general health, nutrition and psychosocial factors. The fifth visit for nulliparous women (the fourth for parous women) should occur at 32 weeks. Nulliparous women should be encouraged to take a formal series of childbirth classes during weeks 32–38. Parous women should take a refresher class or two at 36–38 weeks.

The sixth, seventh and eighth prenatal visits for nulliparous women should occur at 36 weeks, 38 weeks and 40 weeks, respectively, while the fifth and sixth visits for parous women should occur at 36 weeks and 39 weeks. At 41 weeks, nulliparous women should have their ninth and final visit, and parous women, their seventh and final one. By week 36, women should have received information about preparing for labor and birth, when to call and where to go if labor begins. Basic information about family roles and adjustment and newborn care should be provided; parenting classes and infant car seat use should be recommended.

The report lists the physical examination, laboratory test and counseling components of each visit in detail, emphasizing that this suggested schedule, and the specific contents recommended for each visit, "is the core requirement for healthy women at no apparent risk during pregnancy." In comparing its recommendations with those of the ACOG, the panel notes that "the suggested schedule has more visits (beginning with preconception) early to assess risk and to permit delivery of health promotion and interventions for medical and psychosocial risks uncovered. When risk is uncovered, the frequency of visits, the content of visits, or both must be increased."

In the panel's view, its report is the beginning of a process to define and enrich the components of prenatal care: Research is needed to confirm the ideal number of visits for healthy women, as well as to assess programs for women at highest risk. The report points out that even though reducing medical risks is recognized by society as a high priority, many women do not receive adequate medical care because of financial constraints. Perhaps more important, treatment for psychosocial risk factors is not widely accepted and is rarely available.

The report recommends several types of programs that could help reduce psychosocial risk and overcome barriers to prenatal care. Among these are case management and access (addressing such obstacles as financial support, child care and transportation); home visits; comprehensive services for pregnant teenagers (which could be school-based); interventions to improve nutritional status; programs to reduce smoking, alcohol and drug use; services to address domestic violence; interventions to treat psychiatric illness and alleviate stress and anxiety; and programs to help prepare couples for parenthood.

Multidisciplinary approaches to address these problems are vital, the report emphasizes, because social and psychological risks interact with medical risks. Furthermore, the panel argues that the cost of such programs would be less than the cost of care for sick mothers, sick babies and sick families. It recommends coverage for these types of services by Medicaid and private insurance, and suggests that the programs be provided through health maintenance organizations, community health centers, health department clinics and hospital ambulatory care centers.

Research on prenatal risk factors, as well as expanded programs and improved access to prenatal care, are among the surgeon general's goals for 1990. One goal states, "A system should be in place for comprehensive and longitudinal assessment of the impact of a range of prenatal factors . . . on infant and child physical and psychological development." Two additional goals call for "virtually all women [to] be served at levels appropriate to their need" through a regionalized system of prenatal, maternal and perinatal health services, and for the proportion of women in any racial or ethnic subgroup who receive no prenatal care during the first trimester to be 10 percent or less.[5] As data from the AGI report attest, the last two goals are not likely to be met in the near future.

Use of Prenatal Care by U.S. Women

The AGI report provides information on the timing and number of prenatal care visits made by all pregnant U.S. women and by specific subgroups of the population. It also documents provider services in every state and county. Using the ACOG recommendations for prenatal care (which call for 13 visits), and adjusting for length of gestation, the AGI studied three categories of care: *adequate care,* defined as beginning in the first four months of pregnancy and consisting of at least 80 percent of the recommended number of visits; *intermediate care,* also beginning during the first four months, but including 50–79 percent of the recommended number of visits; and *inadequate care,* either beginning after the first four months of pregnancy or consisting of fewer than half the recommended number of visits. In addition, the AGI report presents the proportion of women who make fewer than nine prenatal care visits, as a measure of insufficient care, as well as the proportion receiving delayed care (beginning in the second trimester) or late care (beginning in the third trimester or no prenatal care at all).

On the basis of data for all women giving birth in 1984–1986, the report finds that nationally, 67 percent of women receive adequate prenatal care, 18 percent receive intermediate care and 16 percent (about 585,000 women each year) receive inadequate care. Furthermore, 24 percent of pregnant U.S. women make fewer than nine prenatal visits, and 24 percent initiate care in the second or third trimester or receive no care. The numbers receiving delayed and late care, (672,000 and 215,000, respectively) are of particular concern in light of the Public Health Service panel recommendations regarding the importance of early risk assessment and intervention. The AGI report also indicates that the proportion of women beginning care in the third trimester and the proportion receiving no prenatal care have both gradually increased since 1980.

Another of the AGI's findings is that the proportion of women receiving inadequate prenatal care is above average in certain subgroups of the population. Thirty percent of women with less than 12 years of education receive inadequate care, as do 33 percent of unmarried women and teenage women. The highest proportion of women receiving inadequate care (37 percent) is found among teenagers younger than 18, who account for more than one-third of all teenage births. The report notes that these same subgroups are more likely to be poor, and that poverty is associated with both delayed and inadequate prenatal care. (Nationally, 13 percent of births are to teenagers, 22 percent are to unmarried women and 20 percent are to women with less than 12 years of education.)

Among whites, who account for 81 percent of all births, 13 percent receive inadequate care and 21 percent receive delayed or late care. Among Asians, the proportions are comparable to or somewhat higher than those for whites. In contrast, the proportions of U.S. blacks, Hispanics and Native Americans receiving inadequate care are 27, 30 and 32 percent, respectively, and the proportions obtaining delayed or late care are 39, 39 and 42 percent, respectively.

The lowest levels of inadequate care are in the North Central region, both for all women and for each high-risk subgroup. In contrast, the Northeast has the highest proportion of black women receiving inadequate care, and the South has the highest proportion of all women, teenagers, older women, unmarried women and Hispanic women who receive inadequate care. The South also has the highest proportion of women obtaining delayed or late care, and the highest proportion of women making fewer than nine prenatal visits.

The proportion of women obtaining delayed or late care ranges from 14 percent in Connecticut and Rhode Island to 40 and 41 percent in the District of Columbia and New Mexico, respectively. Similarly, the proportion of women receiving inadequate care ranges from 10 percent or less in Connecticut, Iowa, Maine, Massachusetts, New Hampshire, Rhode Island and Wisconsin to 27 and 28 percent in New Mexico and the District of Columbia, respectively.

The AGI report also provides data on birth outcomes, or characteristics of liveborn infants, by mother's race and at the regional, state, and county levels. Nationally, 6.8 percent of all newborns (about 255,000 annually) weigh less than 2,500 g, and 10.2 percent (383,000) are born before 37 weeks' gestation. Babies born to Asian mothers have the lowest rate for both low birth weight and prematurity (5.3 percent and 7.4 percent, respectively). Those born to whites have slightly higher rates (5.6 and 8.6 percent), while Hispanic infants are at somewhat greater risk for low birth weight and prematurity (6.2 and 11.1 percent, respectively), as are babies of Native Americans (6.0 and 12.3 percent). Babies born to black women have the highest rates of low birth weight and prematurity (12.7 and 18.3 percent, respectively).

Low birth weight and preterm delivery are more prevalent in the South than elsewhere. From 1984 through 1986, the proportion of preterm births increased slightly in all regions, but the proportion of infants born underweight remained about the same. The proportion of underweight newborns is 5.5 percent or less in 10 states (Alaska, Idaho, Iowa, Maine, Minnesota, Nebraska, New Hampshire, North Dakota, Washington and Wisconsin). Five states (Alabama, Georgia, Louisiana, Mississippi and South Carolina) and the District of Columbia have proportions of eight percent or more.

The lowest levels of preterm births, 7.1–8.1 percent of all live births, occur in 10 states (Iowa, Maine, Massachusetts, Minnesota, New Hampshire, North Dakota, Oregon, Utah, Vermont and Wisconsin). Four states have levels of 12.0–13.0 percent (Alabama, Georgia, Louisiana and South Carolina) the highest levels, 14.0 percent and 17.4 percent, occur in Mississippi and the District of Columbia, respectively. The AGI report notes that there have been no decreases recently in the proportion of U.S. babies born either preterm underweight, and in some states, there have even been small increases.

The mortality rate for all U.S. infants younger than one year declined from 13.8 per 1,000 in 1978 to 10.4 per 1,000 in 1986 and to 9.9 per 1,000 in 1988. The 1986 rate represents 39,000 infant deaths. During 1984–1986, the rate for blacks showed almost no improvement, and the 1986 black infant mortality rate was about twice that for whites (18.0 vs. 8.9 per 1,000). The infant mortality rate ranges from below 9.0 per 1,000 births in eight states (California, Colorado, Iowa, Kansas, Maine, Massachusetts, North Dakota and Utah) to more than

12.0 per 1,000 in six (Alabama, Georgia, Illinois, Mississippi, South Carolina and South Dakota) and the District of Columbia.

The surgeon general's goals for 1990 include reducing the national infant mortality rate to no more than 9.0 deaths per 1,000 overall, and to no more than 12.0 per 1,000 within any racial or ethnic subgroup. While the national goal seems within reach in the next few years, the most difficult task will be lowering black infant mortality. Two additional 1990 goals are to reduce the proportion of low-birth-weight babies in the United States to no more than five percent of all live births, and to reduce the proportion in any county or racial or ethnic subgroup to no more than nine percent. Blacks, with 12.7 percent of infants born underweight, are the only subgroup that has not reached this goal. In addition, although most counties have proportions below nine percent, only 23 percent of counties have proportions meeting the national goal of five percent or lower.

Services for Low-Income Women

On the basis of 1985 data, the AGI report shows that 64 percent of pregnant women in the United States have private insurance that covers all or part of their expenses for medical care related to pregnancy and childbirth. However, because insurance depends on type of employment and payment of premiums, relatively few low-income women have coverage for maternity care. Seven percent of all women who become pregnant are enrolled in Medicaid, which subsidizes prenatal care, and another 10 percent qualify for the program some time during pregnancy or as a result of the birth; thus, Medicaid pays for 17 percent of all deliveries. In addition, four percent of pregnant women are covered by the Civilian Health and Medical Program of the Uniformed Services. Twenty-six percent of women have no insurance coverage at the beginning of pregnancy, and 15 percent have none even at delivery. Hospital expenditures for these deliveries are likely to be absorbed as "uncompensated care."

According to the AGI, successive expansions of eligibility for Medicaid since 1985 have probably increased the proportion of women whose deliveries are paid for by the program and decreased the proportion with no insurance at delivery, but the extent of the change is not yet known. Also unknown is whether expanded eligibility has increased the use of prenatal care services or changed sources of care.

Women who have adequate insurance generally obtain clinical prenatal care from private physicians, but many women on Medicaid or without insurance are unable to find physicians who will accept them. (The report notes that according to a 1987 ACOG survey, 63 percent of obstetrician-gynecologists providing prenatal care accepted some Medicaid patients during 1986, and for about one-third of these physicians, Medicaid patients accounted for 21 percent or more of their practice. Some physicians also provide care free or at reduced fees for poor, uninsured women.) For other women, prenatal care is available through a complex network of publicly supported clinics and programs that have been established, financed and administered for separate purposes, with different target populations in mind.

The AGI looked at five of these programs: Medicaid, the Maternal and Child Health (MCH) block grant, community and migrant health centers, the Indian Health Service (IHS) and the Special Supplemental Food Program for Women, Infants and Children (WIC). In 1989, Medicaid eligibility was expanded to include all pregnant women and infants in families below 75 percent of poverty, and states were encouraged to extend the income eligibility criterion to 185 percent of poverty; at least 14 had done so by July 1989. However, the average Medicaid reimbursement is only about two-thirds the national average physician fee for total obstetric care.

Federal funds are also made available to the states through the MCH block grant. Under broad guidelines, states are free to determine the type, scope and delivery of services offered, which may include maternity and infant care, high-risk pregnancy programs, neonatal intensive care units, pediatric health services, services for children with special health care needs and family planning. Federal MCH funds may not be used for inpatient care, except for high-risk women.

In fiscal year (FY) 1989, total federal MCH block grant funding was $554 million. The proportion used for prenatal care is not known, but in 1986, MCH funds were used by every state except four (Alaska, Montana, North Dakota and Wyoming) to support prenatal care for an estimated 447,000 women. MCH funds usually go to health departments and hospitals, although some go to community health centers and other organizations.

Community health centers and migrant health centers provide federally subsidized primary health care services to, respectively, persons in medically underserved areas and migrant or seasonal workers and their families. In FY 1989, $415 million was appropriated for the former and $46 million for the latter. The centers, which serve an estimated 213,000 pregnant women per year, are required to provide or arrange for delivery and perinatal care. Data for 1987 suggest that 85 percent of the centers offer prenatal care, but that 34 percent of these serve low-risk women only.

Appropriations for the IHS in FY 1989 were $1.02 billion; this agency provides service to more than one million eligible Native Americans and Alaskan Natives in the 32 reservation states. Maternity care is not specifically mandated in the IHS statute or regulations, but is a significant component of primary care services. Women are usually seen by obstetrician-gynecologists or nurse-midwives in the larger facilities and by family practitioners in smaller ones. Most IHS programs offer ancillary services such as prenatal classes; social services; and counseling on nutrition, smoking and substance abuse. Most high-risk women seeking care through the IHS are referred to other providers for specialized care, and contract funds pay for the referred services. Of the 40,000 births each year to Native American parents, an estimated 28,000 are to women served by the IHS. However, many of these women are referred elsewhere for delivery; only about 13,000 deliver in an IHS facility.

FY 1989 appropriations for the WIC program, operated by the Department of Agriculture, were $1.9 billion. The program provides supplemental foods, nutrition education and health care referrals to eligible low-income women who are pregnant, breastfeeding or new mothers. It also serves infants and children up to the age of five. To qualify for WIC, women and infants must meet low-income requirements; most states have set the eligibility standard at 185 percent of poverty. They also must be at nutritional risk, as indicated by anemia, abnormal weight gain during pregnancy, a history of high-risk pregnancies, low birth weight, stunted growth, being underweight or overweight or having an inadequate dietary pattern. Women and children who meet the eligibility requirements receive vouchers to purchase specific foods high in protein, calcium, iron and vitamins A and C. The program also provides nutrition counseling and promotes breastfeeding.

Even if these programs meet their respective goals, gaps in the availability and coverage of prenatal care will inevitably occur because of limitations in the types of services each provides. Although Medicaid reimburses providers for both hospital and nonhospital care, MCH block grant funds may be used for hospital care for high-risk women only, and most community and migrant health centers do not pay for delivery expenses. Depending on the state, use of MCH funds may be limited to low-risk women, high-risk women or those with specific types of problems.

The AGI report shows that as many as 5,400 clinic sites in the United States may offer prenatal care to women free or at low cost. AGI surveys identified 2,017 sites operated by state, county, city or other local health departments where prenatal services are provided and 289 prenatal care provider sites operated by other agencies with funding from state MCH programs. In addition, there are 1,421 community and migrant health center sites providing primary care, but those offering prenatal care were not identified. While direct information on prenatal care clinic services in hospitals was also unavailable, 1,661 nonfederal hospitals were identified as probable providers, on the basis of three criteria: They handle at least 400 deliveries annually, they have an outpatient department and they have at least one obstetrician-gynecologist on staff. In addition, 124 privately operated birth centers in 36 states provide prenatal care, but the extent of enrollment of low-income women is not known. The distribution of prenatal care service sites varies across the country and within states, and many gaps are evident from the AGI data. In 799 counties, no hospital or nonhospital clinic was identified that might provide prenatal care, even though 215,000 births occur each year to women who live in these counties.

In response to an AGI survey, local health officials cited insufficient funds, transportation difficulties, shortages of physicians and other medical resources, and the high cost of professional liability insurance as major problems in delivering clinical prenatal care services. Furthermore, they indicated that genetic counseling and treatment for alcohol and drug abuse are not generally provided through health departments. In fact, even where alcohol and drug treatment facilities are available, they may not accept pregnant women. According to the AGI, a recent survey in New York City showed that of 78 drug treatment programs, 42 refuse service to pregnant addicts, 52 refuse women who are on Medicaid and 68 will not serve pregnant women on Medicaid who are addicted to crack.

Both the Public Health Service and the AGI reports recognize that although the majority of women in the United States obtain adequate prenatal care, changes must be made to improve the quality and access to care for certain subgroups of the population, particularly low-income women, teenagers, less-educated women, blacks, Hispanics and Native Americans. According to the AGI report, 34 percent of pregnant U.S. women obtain less-than-adequate care, and the Public Health Service panel suggests that many women at risk for poor pregnancy outcomes are not receiving early care. The Public Health Service report stresses the need to improve psychosocial risk assessment for pregnant women, and the need to provide counseling and home visits to address such problems as stress, substance abuse, family adjustment and child care, as well as transportation and financing for medical visits. Both reports agree that more research is needed on the availability and success of programs that include psychosocial services for pregnant women.

The AGI report concludes that the recent expansion of Medicaid coverage for a large number of poor and marginal-income women and their infants represents a step in the right direction. "However, if that coverage is to be complete, concentrated efforts will be required to make its availability widely known and to make the determination of eligibility prompt and easy, preferably in settings more convenient and more appealing then welfare offices," the report adds. "In the absence of such concentrated efforts, the main result of liberalization of eligibility for maternity care will be that women currently without insurance (or with insufficient insurance) will be covered for delivery, but use of [prenatal care] services may show little improvement." The report also notes that Medicaid eligibility expansion does not guarantee that providers are available, able and willing to offer the medical and psychosocial services that pregnant women need, in ways that are convenient and acceptable to them.

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Teenage Welfare Receipt . . .

(Continued from page 20)

evidence on causal processes. For example, we can shed no light on the ways in which a welfare trap might be expected to operate, such as reductions in the labor supply or deterioration of values and attitudes. Clearly, such knowledge is crucial for the design of effective income maintenance programs for teenage mothers.

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Document

More on Koop's Study of Abortion

In 1987–1988, Surgeon General C. Everett Koop conducted a study of the medical and psychological impact of abortion on women. The report that the Surgeon General had been expected to make was never released, but some information was made public via a letter Koop wrote to President Ronald Reagan summarizing his findings.[1] As part of the House of Representative's role to review government activities, the Human Resources and Intergovernmental Subcommittee obtained a copy of the report, and then conducted hearings into what Subcommittee Chairman Ted Weiss (D.-New York) felt were discrepancies between the report and information made public. The subcommittee's report, *The Federal Role in Determining the Medical and Psychological Impact of Abortion on Women*, was released in November 1989 and is excerpted below.

The Subcommittee Hearings

. . . The idea of a Surgeon General's report on the health effects of abortion on women originated with a 26-year-old White House aide, Dinesh D'Souza, former editor of the *Dartmouth Review*, who thought that the report could be used to reverse *Roe* v. *Wade*.[2] According to the Surgeon General, . . . the decision to request a report also served as the "final bone that [President Reagan] threw to the Pro-Life people," who were angry about the ousting of an antiabortion activist from her position as director of the Office of Population Affairs at HHS [the Department of Health and Human Services].[3]

On July 30, 1987, in remarks at a briefing of Right-to-Life leaders, President Reagan directed the Surgeon General to prepare a comprehensive report on the health effects of abortion on women. In response, Dr. Koop or his staff met privately with 27 groups that had "philosophical, social, medical or other professional interests in the abortion issue."[4]. . . In addition, Dr. Koop's staff compiled and reviewed more than 250 articles from the scientific literature.

In January 1989, Dr. Koop met with the Secretary of Health and Human Services, Dr. Otis Bowen, and a decision was made not to release the abortion report. Instead, the Surgeon General wrote a letter to President Reagan, dated January 9, 1989, that concluded that "the available scientific evidence about the psychological sequelae of abortion simply cannot support either the preconceived beliefs of those prolife or those prochoice."[5] Dr. Koop also concluded that, "for the physical situation," such problems as infertility, later miscarriage, and low-birth-weight babies can occur to women who have had abortions and those who have not, and are therefore "difficult to prove as abortion sequelae."[6] In summary, Dr. Koop concluded that "I regret, Mr. President, that in spite of a diligent review on the part of many in the Public Health Service and in the private sector, the scientific studies do not provide conclusive data about the health effects of abortion on women."[7]

Roe v. *Wade*, the Supreme Court decision that made abortion legal in every state, was partly based on the medical evidence that first-trimester abortions were less dangerous than pregnancy. The Surgeon General's study and report are therefore relevant to future legal decisions and legislative decision-making regarding abortion. . . .

In contrast to the Surgeon General's January 9, 1989, letter to President Reagan, which stated that the physical risks of abortion are unclear, the final draft of the Surgeon General's report, dated January 17, 1989, concluded that abortion does not pose a physical risk to the mother.[8] Both the letter and the report concluded that the psychological effects of abortion are unclear. According to the report, some researchers have concluded that the psychological impact of abortion is very negative, whereas others say that [it is] usually more positive than carrying an unwanted child.

The draft report also emphasized the goal of "eliminat[ing] the need for abortion" by strong prevention programs, education about pregnancy and contraception, and strengthening incentives for alternatives; these issues were not raised in the letter, but Dr. Koop supported them in his testimony before the Human Resources and Intergovernmental Relations Subcommittee.[9]

In his letter to President Reagan, the Surgeon General recommended that HHS spend at least $10 million to study the long-term impact of pregnancy, including the impact of abortion. Such research would also provide more information about the psychological impact of childbirth or giving a child up for adoption, which would provide an appropriate comparison to women who have had abortions. Although the study was mentioned in the report, neither the funding level nor the details of the study were described. . . .

The Medical Impact of Abortion

Mortality—Since 1972, the Centers for Disease Control (CDC) has attempted to identify and investigate every abortion-related death in the United States.[10] According to Dr. David Grimes, professor of obstetrics and gynecology and preventive medicine at the University of Southern California and former chief of the Abortion Surveillance Branch at CDC, since the legalization of abortion following *Roe* v. *Wade* in 1973, "the risk of death from abortion has decreased more than fivefold to less than one death per 100,000 procedures, which is less than the risk of death from an injection of penicillin."[11] Dr. Grimes served as a consultant to the Surgeon General and his staff in their preparation of the abortion report.

Dr. Carol Hogue, Director of the Division of Reproductive Health of the Centers for Disease Control, has published articles in medical journals concluding that childbirth is seven times more likely to result in maternal death than abortion.[12] Dr. Hogue served as a consultant to the Surgeon General and his staff for the Surgeon General's abortion report.... An article published in the *American Journal of Public Health* in 1987, using more comprehensive data than were previously available, concluded that pregnancy and childbirth are 25 times more likely to result in the death of the mother than an abortion.[13]... Despite the review of these articles by the Surgeon General or his staff, Dr. Koop did not mention mortality related to abortion or pregnancy in the report or letter....

Other Health Effects—... Because of the flaws of the research indicating medical problems resulting from abortion, the Surgeon General's draft report concluded that abortion has no medical disadvantages. The report concluded that infertility, miscarriage, low birth weight and other reproductive problems "are no more frequent among women who experienced abortion than they are among the general population of women. "...

Health Impact of Legal vs. Illegal Abortion—... In early drafts of the abortion report, the Surgeon General or his staff included references to the comparative safety of legal abortion, but these were eliminated in the final draft report and letter to President Reagan. For example, a section was eliminated that stated: "What would happen tomorrow if abortion were made illegal? There may be a decrease in the number of abortions each year, maybe by one-third.... The worst result would be that some would be forced to resort to unsafe, illegal abortions. Maternal morbidity and mortality would become a serious problem. To make abortions illegal would only continue the national struggle."[14]

In the final draft report, the only mention of these issues is that 90 percent of abortions are now in the "safer first trimester." In the letter to President Reagan, the only reference is a sentence stating that "[c]learly, however, the incidence of physical injury is greater in instances where abortions are performed or attempted by those not qualified to do them or under less than sterile conditions."

Mental Health—Regardless of their position on abortion, mental health experts agree that much of the research on psychological impact is flawed.[15] They cite problems... that included measures of mental health that are not objective, sample sizes that are small, the difficulty of finding a comparison group of women who continued unwanted pregnancies to term and the fact that there is no way of knowing whether the women who get abortions are different psychologically from other women even before the abortion.[16] For example, if women who have unwanted pregnancies tend to be less well adjusted, less capable of taking care of themselves, and so on, they would probably continue to have those problems whether or not they obtained an abortion.

In their review paper presented to the Surgeon General, the American Psychological Association concluded that, despite the flaws in the research, there is so little evidence of psychiatric problems following abortion, and so much evidence of relief, that therefore abortion does not cause more psychiatric problems than unwanted pregnancy.[17] They also argued that given the large number of abortions, any significant psychiatric problems would have become very obvious to the mental health system in the last 15 years.[18]...

The two researchers representing the National Right-to-Life Committee in meetings with the Surgeon General, who testified before the subcommittee, based their conclusions on interviews with women who have had abortions and are now unhappy about their decision.[19] Those researchers quoted women who said that they had nightmares, feelings of guilt, attempted suicide and other negative feelings that they were unable to confide in others, including therapists.[20]... Dr. Koop described similar situations in his testimony and in his meetings with advocates in preparation for the report, but also stated that anecdotal information was unscientific and therefore not sufficient proof.[21]...

Findings and Conclusions

The Surgeon General agreed... that childbirth is much more likely to result in the death of the mother than an abortion.[22]...

When asked why mortality statistics were not included in his letter to President Reagan or in the report, Dr. Koop responded that those comparisons were well-known, but that the subject of the report and letter were long-term health effects, not mortality.[23]...

In his testimony, Dr. Koop dismissed most of the research literature on [the] psychological impact of abortion, saying that it did not include long-term follow-up of women who have had abortions, and therefore was flawed. He gave an example of a woman he knew who had no problems resulting from her abortion until many years later when she reached out to hold her first grandchild and felt terrible guilt and depression.[24]...

In response to these concerns, the American Psychological Association concluded that the millions of women who have had abortions would have already resulted in a significant mental health epidemic if this was a problem even among a small percent of women who had abortions in the 1970s or earlier.[25] For example, they pointed out that if 10 percent of the women obtaining abortions had severe problems as a result, there would be 100,000 women needing mental health care every year to deal with their abortions. Although Dr. Koop testified that he believes that abortion can cause long-term psychological problems for some women, he admitted in his testimony that this is not a public health problem.[26]...

In one of his last private meetings with consultants to the abortion report, with an "ad hoc group of distinguished psychiatrists" on September 15, 1988, Dr. Koop expressed doubts about the existence of a Postabortion Stress Syndrome, saying "... the people who would like to see a report that the health effects of abortion are so devastating that abortion should be stopped, use as one of their weapons the fact that there is such a thing as a postabortion syndrome.... As we have talked to various groups, there is no doubt that there are people who experience a postabortion syndrome, but there are people who have a post–death-of-my-child syndrome, post–death-of-my-mother syndrome, post–lost-my-job syndrome."[27]

In his private meetings with Right-to-Life advocates, Dr. Koop expressed concerns about the poor quality of their research evidence and told them that they would have to provide better proof if they wanted a Surgeon General's report consistent with their point of view.... In his public statements, he talked about how PHS [Public Health Service] scientists were asked to review the major articles and found them all to be flawed; in fact, however, written reviews were only requested for the National Right-to-Life Committee's "white paper" [*The Psychological Aftermath of Abortion*]. No reviews were requested for the articles showing that abortion was psychologically safer than childbirth.[28]

Dr. Koop has repeatedly stated that he wanted an unbiased report, and at several of his meetings with advocates, Dr. Koop expressed his concern that the report not embarrass the "office and the title of the Surgeon General" and that he wanted "to leave it as pristine when I go as I found it when I came."[29] On the other hand, Dr. Koop admitted that his personal bias against abortion remains,[30] and this bias may explain why the letter to President Reagan, which was released instead of the report, is not consistent with the weight of evidence or with the Surgeon General's own testimony regarding the physical or mental health effects of abortion. . . .

The Surgeon General testified that "most abortions would not take place if pregnancies were not unplanned and unwanted. Therefore, it seems that efforts should be directed toward whatever means would minimize the number of unwanted and unplanned pregnancies."[31] Dr. Koop cited "expansion of research into reproduction and male and female contraception" as an important focus of such efforts.[32]. . .

Despite the research evidence supporting the need for contraceptive research and educational programs regarding the correct use of contraceptives, the federal government provides very little funding for such efforts. Last year, NICHD [National Institute of Child Health and Human Development] spent $9.5 million on contraceptive development.[33] This represents a reduction of almost 50 percent compared to the $12 million spent in FY 1980, when inflation is taken into account.[34] According to the NICHD, contraceptive funding could drop as low as $5 million for FY 1990, which would represent a cut of more than 70 percent when inflation is taken into account.[35]. . .

According to Dr. David Grimes, . . . in 1983, the White House insisted that Dr. Willard Cates, Jr., who was then in charge of the Reproductive Health Division at CDC and had published many scientific articles on abortion, be fired or transferred because of what was perceived by the White House advisers to be a prochoice advocacy and bias.[36] Dr. Cates was demoted and transferred to a position at the Division of Sexually Transmitted Diseases, and was later promoted to his current position as director of that division.

Dr. Grimes and other colleagues at the Abortion Surveillance Branch also left their jobs during the following few years because of limitations placed on their research and publications.[37]. . . Similarly, Dr. Grimes testified that the 1981 annual CDC abortion surveillance report, which provided national statistics on mortality and morbidity, was delayed for two years, apparently for political reasons.[38] Dr. Grimes testified that even policy documents in other areas of health care were influenced by CDC's decision to omit mention of abortion, for example, in guidelines pertaining to pregnant women with AIDS.[39]. . .

The CDC's role continues to be restricted by political considerations. More than five years ago, the CDC stopped comparing the mortality and morbidity of women who had abortions with women carrying the pregnancy to term.[40] This is an important change because the comparisons have indicated that women are between seven and 25 times more likely to die from childbirth than from legal abortion. When asked why this change was made, CDC officials had no explanation, but merely stated that "[d]irect comparisons like those made in earlier years can be easily made with data supplied by CDC."[41]

Other types of research on abortion would be extremely useful for federal policymakers. For example, in the 1970s and early 1980s, the CDC studied the impact of legal restrictions on Medicaid funding for abortion on access to abortion, infant mortality and maternal morbidity and mortality. Such research could be used to help inform the federal government about the results of the Hyde Amendment and similar laws. However, these types of studies are no longer conducted or published.[42]. . .

Research on abortion is occasionally published by CDC scientists, but the quantity and type of such articles has changed substantially. For example, CDC scientists published 29 articles on abortion in 1980 and 24 in 1981; the number was reduced to four in 1986, two in 1987 and seven in 1988.[43] Whereas the publications in the early 1980s included policy information such as the impact of the Hyde Amendment, which restricted Medicaid coverage of abortions, or the relative safety of different abortion procedures, the vast majority of the most recent publications are merely statistical information, such as the annual number of abortion deaths nationwide.

Recommendations

Virtually all Americans would welcome a reduction in the number of unwanted pregnancies, which would also reduce the number of abortions. The Surgeon General concluded that an effective way to reduce the number of abortions is to improve contraceptives. And yet, the federal government has cut its funds for contraceptive development by almost half since FY 1989, and at the same time, worldwide public and private funding for contraceptive development had been cut substantially.

Lack of research funds for contraceptive development has meant that there are fewer types of contraceptives available than there were a few years ago. The long-term costs include a larger number of unwanted pregnancies, some of which translate to large financial outlays for foster care, welfare payments and a variety of health care, education and social services. From a scientific point of view, long-term costs include a shortage of researchers in the field; with less money available, scientists pursue careers in other areas where research funding is more readily available. As a result, the possibilities of new contraceptive developments have been curtailed for years to come.

Stable funding for research on contraception, at the levels available in the early 1980s, will enable the federal government to support the most promising research and to encourage researchers to stay in the field. More substantial increases would attract more researchers. Such increased funding would be cost-effective for society and the federal government.

The Surgeon General . . . concluded that the inappropriate use of contraceptives contributes to the number of unwanted pregnancies in the United States. However, the Department of Health and Human Services has not played a major role in determining how to improve contraceptive use, even among those teenagers and adults who are already using contraceptives.

In the same ways that developing new contraceptives could prove to be cost-effective, determining how to improve the correct use of available contraceptives also could be a cost-effective use of modest federal research dollars.

Abortion is one of the most common medical procedures in the United States today, and yet the Department of Health and Human Services severely restricts all scientific research which could lead to improved safety or which would compare the physical and mental health effects of abortion with the effects of other available alternatives. Related issues, such as the risks associated with pregnant AIDS patients, have similarly been ignored by the Public Health Service for nonscientific reasons.

It is crucial that researchers employed by the Centers for Disease Control and elsewhere in the U.S. Department of Health and Human Services be permitted to maintain their objectivity and to conduct the research needed to evaluate health programs and policies and thus improve the health of all Americans. This can best be accomplished by eliminating censorship and minimizing bias in biomedical research.

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DIGEST

Americans Became More Committed to Both Sides Of Debate over Abortion During the Past Decade

Both supporters and opponents of abortion rights have grown more vocal and active in their position, according to a recent Gallup poll.[1] Americans who favor maintaining the legality of induced abortion were twice as likely ever to have written letters to public officials or donated money to prochoice organizations in 1989 as they were in 1979. They also were far more likely both to say that a candidate's position on abortion is important to them and to report that they feel strongly in favor of legal abortion. On the other hand, over the same period, citizens against legal abortion also stepped up their political activity and were somewhat more likely to say both that a candidate's position on the issue is important to them and that they feel strongly about their beliefs. Overall, opponents of abortion are still far more likely than proponents to participate politically in the abortion issue, but the poll report concludes that "the balance of activism has shifted" over the past 10 years.

In October 1989, the Gallup Organization polled 1,234 U.S. men and women. Among the questions were a number on abortion—in particular, on the respondents' degree of commitment to and involvement in the abortion issue. Overall, 61 percent of those surveyed said they did not want to see *Roe* v. *Wade* overturned; the proportion was greater among highly educated and higher income respondents than among less-educated and lower income men and women. For example, 73 percent of college graduates opposed overturning the 1973 Supreme Court decision, compared with 45 percent of those who had not graduated from high school.

The respondents were also asked how strongly they felt about the abortion issue, compared with how they felt about other public issues. Overall, 24 percent said their feelings about the subject were extremely strong, while another 27 percent said they were very strong and 32 percent reported that they were fairly strong; only 17 percent said they had no strong feelings about abortion or no opinion at all. Women were more likely than men to feel extremely or very strongly about the subject (59 percent vs. 42 percent); Republicans and Democrats were equally likely to feel strongly about abortion (53 percent each). The poll results clearly show that men and women opposed to legal abortion had stronger feelings about the issue than did those favoring legal abortion: Seventy-three percent of the former felt extremely or very strongly about the subject, compared with just 42 percent of the latter. Between 1979 and 1989, among respondents favoring *Roe* v. *Wade*, the proportion who said they felt extremely or very strongly about the issue climbed from 25 percent to 43 percent; among those opposed to the 1973 decision, this proportion rose from 70 percent to 74 percent.

Eighteen percent of respondents said they had written a letter about abortion to a public official or donated money to an organization involved in the abortion issue (or both), including 31 percent of college graduates and 27 percent of those with a household income of $50,000 or more. Those who favored overturning *Roe* v. *Wade* were almost twice as likely to have done so as were those supporting the decision (27 percent vs. 15 percent).

However, a comparison with past survey findings indicates that the proportion of people involved politically in the abortion issue has grown more substantially among those with prochoice sentiments than among those with antiabortion beliefs. For example, between 1979 and 1989, the proportion of Americans opposed to overturning *Roe* v. *Wade* who became involved in the issue more than doubled, from seven percent to 15 percent; among those in favor of overturning it, the proportion grew from 20 percent to 27 percent.

Fourteen percent of those surveyed said that a candidate's position on abortion was one of the most important factors in helping them decide whom to vote for, and another 29 percent said that abortion was a very important factor; 55 percent, on the other hand, said that it was either somewhat or not at all important in their decision-making. Once again, women were more likely than men to report that abortion was highly or very important (49 percent vs. 36 percent).

However, the biggest factor in the effect of abortion on people's voting decisions was their position on *Roe* v. *Wade*. Fully 63 percent of those who favored overturning the Court's decision said that abortion was either highly or very important in their decision about whom to vote for, compared with only 34 percent of those who opposed setting the decision aside. Nonetheless, between 1979 and 1989, among all respondents who had an opinion, the proportion opposed to overturning *Roe* v. *Wade* who said that abortion was highly or very important in their voting decision rose from 18 percent to 34 percent, whereas among those who favored overturning the Court's decision, the proportion climbed from 56 percent to 65 percent.

Overall, these Gallup poll results confirm the strong division in American society over the acceptability of legal abortion: The majority of Americans appear to favor keeping *Roe* v. *Wade*, but the minority who oppose it do so more strongly. Thus, comparable percentages of all respondents either strongly favor (26 percent) or strongly oppose (24 percent) the 1973 Supreme Court decision, and about 21 percent each say that the abortion issue is an important factor in their political decision-making.—*M. Klitsch*

Reference

1. D. Colasanto and L. DeStefano, "'Pro-Choice' Position Stirs Increased Activism in Abortion Battle," *Gallup Report*, No. 289, 1989, p. 16.

Women Who Lack Health Insurance Coverage Are More Likely to Bear Seriously Ill Newborns

In 1986, a new mother in the San Francisco Bay area who lacked health insurance coverage was more likely than an insured mother to have given birth to an infant who was seriously ill or who died, according to a recently published study.[1] Moreover, this likelihood increased through the 1980s, but only among blacks and Hispanics: Compared with blacks with public or private insurance coverage, uninsured blacks went from being no more likely to have a seriously ill newborn in 1982 to being more than twice as likely by 1986. Furthermore, by 1986, uninsured blacks were more than four times as likely as privately insured whites to have had a seriously ill newborn. The investigators who conducted the study suggest that their findings are probably related both to poor and minority women's relative inability to obtain private health care and to the reduction in access to publicly funded services during the 1980s.

Data on the delivery of San Francisco Bay area newborns during the last half of 1982 and in 1984 and 1986 were collected and analyzed by insurance coverage for hospital charges (private insurance, Medi-Cal, some other payer or no insurance). Of the more than 60,000 newborns from 1986 who were studied, 8.0 percent were uninsured at birth, up significantly from the 5.5 percent of newborns who were uninsured at birth in 1982. Hispanic babies were the most likely to be without coverage (19.7 percent), while black infants were the least likely (3.4 percent). The percentage uninsured grew significantly in all ethnic subgroups between 1982 and 1986, but the increase was greatest among Hispanics (from 8.2 percent to 19.7 percent) and Asians (from 7.8 percent to 12.0 percent).

The investigators conducted a multivariate analysis that controlled for race or ethnicity, multiple gestation and the presence of a birth defect. They found that in 1984 and 1986, the risk of having an adverse outcome (measured by hospitalization for six or more days, transfer to an acute-care or long-term facility or death while in the hospital) was significantly greater for babies born to uninsured mothers than for those born to privately insured mothers. In addition, the overall relative risk of an adverse outcome rose significantly; by 1986, an uninsured newborn was 1.3 times more likely than an insured infant to have an adverse outcome. The relative risk among blacks climbed from 0.9 in 1982 to 2.2 in 1986 (significant at $p<0.01$), and the relative risk among Hispanics climbed from 1.2 to 1.6 over the same period (significant at $p<0.05$). Among whites, Asians and others, there was no significant trend over time.

When they were compared with privately insured white newborns (whom the investigators hypothesize to have been the group with the greatest socioeconomic advantage and the best insurance coverage), uninsured black, Asian and Hispanic newborns were significantly worse off in every year. For example, in 1986, uninsured black newborns were 4.3 times as likely as privately insured whites to have an adverse hospital outcome. Moreover, among uninsured black and Hispanic newborns, the relative severity of their disadvantage grew significantly between 1982 and 1986 (from 1.8 to 4.3 among blacks and from 1.4 to 2.0 among Hispanics, respectively).

In separate multivariate analyses, the investigators controlled for the effects of race or ethnicity, multiple gestation and birth defects, and found that newborns lacking insurance were 1.3 times more likely than those covered by insurance to be of low birth weight or to have been born malnourished. Nonetheless, when the researchers controlled for the incidence of low birth weight or malnourishment as well as for type of hospital and type of payer, they found that lack of insurance coverage remained associated with a greater risk of adverse outcome.

The investigators pointed out several sources of bias in their study. For example, some healthy babies born by cesarean section in 1982 (when routine hospital stays for cesareans were longer than they are now) might have been misclassified as having an adverse outcome. Likewise, sick newborns not covered by insurance may have been more likely to be discharged early because of financial pressures at the hospital. However, because uninsured mothers were less likely to have cesarean deliveries and more likely to feel pressure for an early discharge, both of these biases would tend to decrease any association between lack of insurance and adverse newborn outcomes.

The researchers conclude that lack of health insurance at childbirth is a growing problem in the San Francisco area, and that especially among blacks and Hispanics, it is strongly related to poor health in newborns. Hispanic newborns, in particular, were likely both to have no insurance coverage and to be at high risk of having an adverse outcome in the absence of insurance coverage. They also observe that because the large differences between insured whites and uninsured blacks and Hispanics persisted even after the analysis was controlled for differences in birth weight and fetal malnutrition, these differences may be caused by more than just the poorer women's limited access to prenatal care. Given an increase in poverty among San Francisco blacks and Hispanics over the same time period, the researchers conclude, "the elevated and increasing risks among the uninsured are likely to be related both to the lack of access to private medical care and to the accelerated reduction in public services during the 1980s."—*M. Klitsch*

Reference

1. P. Braveman et al., "Adverse Outcomes and Lack of Health Insurance Among Newborns in an Eight-County Area of California, 1982 to 1986," *New England Journal of Medicine*, **321**:508, 1989.

Adolescents' Attitudes Toward Premarital Sex Affect Religious Activity

Just as religious participation among adolescents influences their sexual behavior and attitudes toward premarital sex, teenagers' sexual attitudes also affect their degree of religious involvement.[1] According to a recent study, the effect varies little according to religious affiliation, suggesting that religious participation in general is more important than any one affiliation in influencing adolescent sexual attitudes and behavior. One explanation may be that when the behavior and attitudes of adolescents who are sexually active or hold permissive attitudes conflict with standard religious teachings, these teenagers tend to adjust their religious attitudes and participation accordingly.

Using a theoretical model developed to test the causal interrelationships between religious service attendance, attitudes toward premarital sex and sexual experience among adolescents, the researchers examined data from a survey of Detroit children and their mothers based on a probability sample extracted from birth records in 1961. The mothers were interviewed in 1962 and five times subsequently over the next 18 years. The children were interviewed in 1980, when they

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were 18 years old. (Adolescents who had married by 1980 were excluded from the analysis, but they represented just three percent of the total.) All of the study subjects were white, and a total of 916 families were included in the full sample of mothers and children interviewed in 1980. Fathers were not represented in the survey, a fact that the investigators admit could limit the interpretation of results.

The mothers (in both 1962 and 1980) and their adolescent children were asked about their religious affiliation, how often they attended services and how important religion was to them. In 1980, the mothers and children responded to questions on the appropriateness of premarital sex, and the adolescents were asked about their sexual experience (i.e., whether they had ever had intercourse, the number of partners they had had and their coital frequency). The researchers collapsed the religious affiliations of the sample into five groups. In 1962, some 53 percent of the mothers were Catholic, 12 percent were fundamentalist Protestant or Baptist, 30 percent were nonfundamentalist Protestant, three percent were Jewish and two percent reported some other or no religious affiliation. (The proportion of Catholics in the sample is higher than the national average.) There were minimal changes in the mothers' religious preferences over the 18-year period.

In 1962, five percent of the mothers reported that they attended services several times a week, 45 percent went once a week, 17 percent attended less than once a month and 15 percent said they never attended services; in 1980, the corresponding proportions were nine percent, 39 percent, 31 percent and six percent, respectively. The adolescents reported consistently less religious attendance than their mothers in 1980; sons reported an even lower frequency of attendance than daughters. (For example, 48 percent of the mothers said they attended services once a week or more, while the corresponding proportions were 35 percent among their daughters and 29 percent among their sons.) Finally, while 68 percent of the mothers said that religion was very important to them, just 42 percent of the daughters and 30 percent of the sons gave that response.

With regard to approval of premarital sex, important differences emerged both between the generations and between the adolescent men and women. Only 32 percent of the mothers approved of premarital sex, compared with 77 percent of the young men and 65 percent of the teenage women. Despite the low approval among mothers, 64 percent of their sons and 55 percent of their daughters had ever had intercourse, and roughly one-quarter of the adolescents had had 2–5 partners.

Bivariate analysis revealed that religious attendance and importance of belief were strongly correlated with adolescent sexuality: Those who attended religious services frequently and considered religion important in their lives also had more restrictive attitudes toward premarital sex and reported less sexual experience. For example, 78 percent of adolescents who never attended services had ever had intercourse, compared with just 39 percent of those who went once a week.

The researchers' theoretical model used underlying variables of religious attendance for the mothers and the adolescents as well as variables on the mothers' attitudes toward premarital sex and the teenagers' attitudes and sexual experience. As the researchers expected, the model accurately predicted that mothers passed their attitudes on to their children and that these attitudes were related to the adolescents' sexual behavior. Although the researchers recognize that adolescents may influence the attitudes of their mothers as well, not enough data were available to include this specific linkage in the model's parameters.

Both the mothers' attitudes toward premarital sex and the teenagers' religious attendance had statistically significant effects on the adolescents' sexual attitudes and behavior. The model also indicated a reciprocal effect: Teenagers' attitudes toward premarital sex appear to have had a statistically significant ($p<0.01$) negative impact on their religious attendance. Although the effect was not as not as large as that of maternal religious attendance, it remained even after the analysis controlled for the child's religious affiliation and the mother's education, age, age and pregnancy status at marriage, marital history and number of children. While adolescent sexual behavior also negatively affected religious attendance, the effect did not reach a level of statistical significance. However, the investigators note that their model was designed to take into account measurement error in attitudes but not in reported behavior.

Using the same controls noted above, the analysis revealed that religious affiliation influences attitudes toward premarital sex more than it does behavior. Adolescents who were fundamentalist Protestants or Baptists had less-permissive attitudes than did teenagers in the other religious categories in the survey. There was no effect of religious affiliation on premarital sexual behavior, except among Jewish teenagers: They were significantly less likely than average to ever have had sex.

Why would permissive attitudes toward premarital sex reduce attendance at religious services? The investigators suggest that "in an environment where most religious institutions teach against premarital sex or encourage its delay, sexual activity before marriage is likely to produce strains in the relationship between the individual and the church that can lead to a significant reduction of religious involvement." They hypothesize that the content of religious teachings is sufficiently negative about premarital sexual activity that young people of all religious affiliations who have accepted premarital sex adjust their religious involvement somewhat as a result. Moreover, according to the study results, actual religious participation has a stronger impact on determining sexual attitudes and behavior than affiliation does; the researchers note that this finding may stem from the somewhat limited religious categories used in their analysis.—*L. Remez*

Reference

1. A. Thornton and D. Camburn, "Religious Participation and Adolescent Sexual Behavior and Attitudes," *Journal of Marriage and the Family*, **51**:641, 1989.

Swedish Women Prefer Reversible Methods; Few Choose to Be Sterilized

Contraceptive prevalence is extremely high among Swedish women, most of whom rely on the pill, condoms or the IUD. The pill is the most popular method among 15–34-year-olds, but older women are more likely to rely on the IUD or barrier-methods. About 12 percent of those using the pill or the IUD report concurrent use of condoms, a trend that is most noticeable among younger women. These are some of the findings of a 1987 survey carried out by the International Health Foundation as part of a multicountry study of contraceptive use, knowledge and attitudes.[1]

Survey questionnaires were mailed to 1,000 Swedish women aged 15–44; 744 (74 percent) replied. In all, 40 percent were married and 23 percent were cohabiting.

Small families were the norm, with 47 percent of the women having no children, 28 percent having one or two and 12 percent having three or more. Most of the women had first had intercourse while they were teenagers: Just under half (49 percent) had been 16 or younger, 34 percent had been 17–19 years old, eight percent had been 20 or older and nine percent had never had intercourse. Although 89 percent reported engaging in intercourse regularly or occasionally, only 22 percent had had an unintended pregnancy. At the time of the survey, 11 percent of the women were not sexually active, 11 percent were pregnant or trying to conceive and three percent were infertile. A total of 75 percent of the women either did not want a birth for at least a year (44 percent) or wanted to have no children or no more children (31 percent).

Overall contraceptive prevalence was very high and varied little by age: Seventy-one percent of all women surveyed and 95 percent of those exposed to the risk of pregnancy were practicing contraception. Among women exposed to the risk of pregnancy, prevalence was highest among 25–34-year-olds (99 percent) and lowest among 15–19-year-olds (90 percent) and 40–44-year-olds (88 percent).

Women exposed to the risk of pregnancy predominantly used the pill (34 percent), condoms (21 percent) or the IUD (19 percent). Six percent were protected by their own or their partner's sterilization, six percent used the diaphragm or spermicides and six percent relied on rhythm or withdrawal. In comparison, a 1987 survey of women aged 15–44 in the United States found that 66 percent of all women surveyed and 92 percent of those at risk of unintended pregnancy were using a contraceptive method.[2] The method-mix differed considerably from that in Sweden: Among women exposed to the risk of unintended pregnancy, 33 percent relied on their own or their partner's sterilization, 32 percent used the pill and 17 percent used condoms. Very small proportions relied on withdrawal (six percent), the diaphragm or periodic abstinence (four percent each), the sponge or the IUD (three percent each) or spermicides (two percent).

Between 1981 (when the World Fertility Survey conducted a national survey in Sweden) and 1987, contraceptive prevalence among women 20–44 years old increased from 64 percent to 75 percent. The proportion of women relying on the pill increased from 19 percent to 27 percent and the proportion relying on sterilization rose from two percent to six percent, while IUD prevalence declined from 17 percent to 16 percent.

Pill use was most popular among younger women, peaking at 66 percent among 20–24-year-olds and then declining to five percent among 40–44-year-olds. The use of barrier methods rose from 19 percent among women 15–19 years old to 35 percent among those 40–44 years old. The IUD was most popular among 35–39-year-olds (31 percent), but was rarely used by those younger than 25. Reliance on sterilization also increased with age, reaching a peak of 13 percent among women aged 40–44. Concurrent use of condoms or other barrier methods was reported by 12 percent of the pill users and two percent of those relying on the IUD, perhaps reflecting recent public information efforts advocating the use of barrier methods to prevent the spread of sexually transmitted diseases.

Women whose education had ended at age 17 had the highest rate (14 percent) of sterilization (their own or their partner's), the lowest rate of pill use (29 percent) and the lowest overall level of contraceptive prevalence (92 percent). In comparison, women who had continued their education to age 18 had the highest level of overall prevalence (100 percent), the highest rate of pill use (50 percent) and a low rate of sterilization (five percent). Women who had continued their education beyond age 18 also had a high level of contraceptive prevalence (95 percent), with the majority using the pill (39 percent) or barrier methods (32 percent) and a small proportion relying on sterilization (four percent). IUD use was highest among women whose education had ended at age 17 (21 percent) and lowest among those who had continued their education beyond age 18 (16 percent).

The sterilization rate, which is low in comparison with the rates in the other European countries surveyed, may reflect resource problems within Sweden's health care system. The investigators observe that because sterilization is generally regarded as a matter of low priority, a wait of a year or more to obtain the procedure is not uncommon. On the other hand, they point out that the proportions of Swedish women who had accurate knowledge of fertility (79 percent) and of how oral contraceptives prevent pregnancy (68 percent) were the highest found in any of the European countries surveyed in the project, which may reflect the presence of contraceptive counseling units in all communities. The investigators conclude that the high level of contraceptive prevalence in Sweden "is probably related to established cultural traditions of family planning and public sexual education."—*F. Althaus*

References

1. F. E. Riphagen and B. von Schoultz, "Contraception in Sweden," *Contraception*, **39:**633, 1989.

2. J. D. Forrest and R. R. Fordyce, "U.S. Women's Contraceptive Attitudes and Practice: How Have They Changed in the 1980s?" *Family Planning Perspectives*, **20:**112, 1988.

Higher Income Women Are More Likely to Have A Cesarean Delivery

Rates of primary cesarean section rise with increasing income, according to a recent study of singleton births in Los Angeles County.[1] Among women with a median family income of over $30,000, the primary cesarean section rate was 23 percent, compared with 13 percent among those with an income under $11,000. Non-Hispanic whites had a rate of cesarean section slightly higher than the rates for Asian Americans and blacks and 48 percent higher than the rate for Mexican Americans. However, the rate of cesarean delivery rose with increasing income within each racial or ethnic group. These differences may be a result of differences in the settings in which poor and middle-income or upper income women receive obstetric care and of differences in the medical decision-making applied to their care.

An analysis of cesarean section rates was based on birth certificate data for 245,854 infants born in 1982 and 1983 to black, non-Hispanic white, Asian-American and Mexican-American women, none of whom had had a previous cesarean delivery. The women were divided into six socioeconomic groups on the basis of the median family income for the census tract in which they lived.

Overall, 18 percent of the infants were delivered by cesarean section. The procedure was 74 percent more frequent among the women with the highest income (over $30,000) than among those with the lowest income (under $11,000)—23 percent vs. 13 percent. Women older than 34 were almost twice as likely to have a cesarean section as those younger than 18 (24 percent vs. 13 percent). Rates rose significantly with income within each age-group, although the difference between the lowest income group and the highest income group was greatest among 18–34-year-olds and smallest among women younger than 18.

In addition, cesarean sections were 60 percent more frequent among women who were giving birth for the first time than among those who had had at least one child (23 percent vs. 14 percent). Although the proportion giving birth for the first time was larger among women with an income over $30,000 than among those with an income of less than $11,000 (50 percent vs. 31 percent), only 12 percent of the differential in cesarean rates could be attributed to socioeconomic differences in the parity distribution. Moreover, parity-specific rates of cesarean section increased with income among both women giving birth for the first time and women who had one or more children.

Infants weighing less than 1,500 g were the most likely to have been delivered by cesarean section (31 percent); the likelihood of cesarean delivery declined among those weighing 1,500–2,499 g (28 percent) or 2,500–4,000 g (16 percent) at birth, then rose among those born weighing more than 4,000 g (23 percent). Socioeconomic status had a strong influence on the birth-weight distribution: The proportion of normal-birth-weight and high-birth-weight infants rose and the proportion of low-birth-weight and very low birth weight infants fell as income increased. In each of the four birth-weight categories, increasing income was associated with a rising rate of cesarean section.

Among women aged 18–34, non-Hispanic whites had the highest rate of primary cesarean section (21 percent), followed by Asian Americans and blacks (about 19 percent each) and Mexican Americans (14 percent). Rates rose significantly with increasing income in each group, but the difference was most pronounced among Mexican Americans. Nevertheless, when maternal age and parity were controlled, socioeconomic status had a significant independent effect on cesarean section rates among all four racial or ethnic groups.

One or more complications of delivery were reported in 16 percent of the births to women aged 18–34; in 71 percent of these cases, delivery was by cesarean section. Women with no reported complications had a cesarean section rate of seven percent, but accounted for 35 percent of the procedures. (The investigators note that because the usual reason for a primary cesarean section is a complication of delivery, this finding indicates that complications may be seriously underreported on birth certificates.) Rates of cesarean section among women without complications rose steadily with median family income, from 6.4 percent among those with an income under $11,000 to 11 percent among those with an income over $30,000. Among women with one or more complications, 65 percent of the lowest income women and 79 percent of the highest income women had cesarean sections. The incidence of recorded complications was highest (19 percent) among women with an income of $20,000–$24,999, but the cesarean section rate was highest among those with an income over $30,000.

The incidence of particular complications varied with income. Complications of pregnancy,[*] breech presentation and cephalopelvic disproportion were reported with greater frequency as income rose. The incidence of cephalopelvic disproportion was 250 percent higher in the highest income group than in the lowest income group (five percent vs. two percent, respectively). The incidence of fetal distress and other complications of labor did not vary with income.

Rates of cesarean section performed specifically because of abnormal presentation, fetal distress or "other" labor complications[†] also increased with rising income. For example, the rate for cesarean sections performed specifically because of other labor complications was 50 percent in the lowest income group and 74 percent in the highest income group. The rates of cesarean section performed because of cephalopelvic disproportion or complications of pregnancy did not show significant socioeconomic differences.

The overall rate of primary cesarean section was 50 percent higher among non-Hispanic whites than among Mexican Americans. Of this difference, 56 percent was accounted for by a lower incidence of reported complications, 11 percent by a lower cesarean section rate in the presence of complications and 33 percent by a lower rate in the absence of reported complications. In general, in each racial or ethnic group, the incidence of reported complications, the cesarean section rate in the presence of complications and the cesarean section rate in the absence of complications all rose with increasing income.

The investigators point out that low-income women would generally be expected to have more complications of pregnancy and delivery than high-income women and therefore, contrary to their findings, a higher rate of cesarean delivery. They suggest that overreporting of complications among the affluent or underreporting of complications among the poor may contribute to this discrepancy. Differences in the settings in which poor and middle-income or upper income women receive obstetric care may be one factor. Compared with higher income women, poor women are more likely to give birth in public hospitals and are less likely to be cared for by private physicians. In addition, health care providers may follow different guidelines in making clinical decisions about care for poor women, regardless of differences in the setting. The investigators conclude that there is "a strong relation between socioeconomic status and the rate of primary cesarean section that [is] independent of age, parity, birth weight, race, and complications."—*F. Althaus*

Reference

1. J. B. Gould, B. Davey and R. S. Stafford, "Socioeconomic Differences in Rates of Cesarean Section," *New England Journal of Medicine*, **321:**233, 1989.

Sterilization Is Unlikely To Alter Most Women's Menstrual Symptoms

Women who are sterilized may have more severe menstrual pain after the operation, but they are unlikely to experience substantial changes in the duration of menstrual flow, their cycle length or midcycle bleeding. However, according to a prospective study of low-income women sterilized at three urban hospitals, these changes appear to be affected by the method of contraception used before sterilization: Women who used oral contraceptives prior to sterilization were more likely than women who had not used the pill or the IUD (i.e., those with "natural" cycles) to experience an increase in the length of their periods.[1]

Women attending gynecologic, obstetric or sterilization clinics in Pittsburgh (at Magee-Women's Hospital), Atlanta (Grady Memorial Hospital) and New York City (Presbyterian Hospital) were screened according to their reproductive intentions; they were eligible for inclusion in the study if they were at least 21 years old, were presumed fertile and did not want more children. The study group comprised women who planned to be sterilized within a few months, while the comparison group was made up of those who did not plan to be sterilized. Pregnant women, who were eligible for the study after 28 weeks of gestation, made up approximately half of the comparison group and slightly more than half of the study group. Only two percent of the women refused to participate.

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[*] Preeclampsia, genitourinary infection, cardiovascular disease, diabetes, anemia and uterine bleeding, as well as problems necessitating transfer of the woman to a tertiary care center.

[†] Amnionitis, sepsis, hemorrhage during labor, postpartum hemorrhage and complications necessitating tranfusion for the mother.

The original sample consisted of 1,213 women who intended to be sterilized and 601 comparison women. Of these, 1,642 (91 percent) completed both a baseline and a follow-up interview. The baseline interview was conducted at the time the woman entered the study, and the follow-up interview was completed an average of 10 months later. At each interview, participants were asked about their last three menstrual periods. Of the 1,107 women intending to be sterilized who completed both interviews, 448 (40 percent) changed their minds or were refused the procedure by health care providers (mostly because of age, parity or administrative barriers, such as lost or invalid consent forms or scheduling problems); these women formed a second comparison group.

Although the three groups were divided equally among the study sites, the patient populations at the hospitals differed considerably: At Presbyterian Hospital, 77 percent of the women were Hispanic and 21 percent were black; at Grady Memorial Hospital, 88 percent were black and 11 percent were white; and at Magee-Women's Hospital, 57 percent were black and 43 percent were white. At all three sites, the modified Pomeroy technique was used for postpartum sterilizations; for interval procedures, Falope banding was used at Magee-Women's Hospital, bipolar electrocautery at Grady Memorial Hospital and either technique at Presbyterian Hospital.

The investigators compared the symptoms the women reported at baseline and at follow-up to determine changes in the length of their menstrual cycles, the length of their periods, the amount of menstrual bleeding, the presence of midcycle bleeding or spotting and the presence and severity of menstrual pain and noncyclic pelvic pain. They then computed, for each symptom, the difference between the proportion of women in each group who experienced an increase in that symptom and the proportion who experienced a decrease.

The range and distribution of cycle lengths in the three groups were similar at baseline and had not changed significantly by the follow-up interview. At baseline, 17 percent of all patients reported bleeding and spotting between periods and 83 percent reported none, a differential of 66 percentage points. By follow-up, the prevalence of this symptom had decreased even further: Among women with natural periods in the sterilization and the comparison groups, the differential had increased by five percentage points, while among sterilized women who had previously taken oral contraceptives, it had increased by 10 percentage points.

When asked at baseline, 19 percent of all participants said they believed tubal sterilization would increase menstrual flow. By the follow-up interview, 31 percent of the sterilized women believed that their bleeding had increased. When asked to compare the actual amount of flow with the amount they had expected, 67 percent said the amount was what they had expected, 11 percent perceived more bleeding than they had expected and 22 percent said they were bleeding less than expected. Overall, the amount of reported bleeding after sterilization was significantly different from the women's expectations (p=0.0002). Significant changes in the duration of flow occurred only among sterilized women who had previously used oral contraceptives. However, there was no significant overall change in the duration of menstrual bleeding.

During each round of interviews, the women were asked to rate their degree of menstrual pain as severe, moderate, slight or none. About half of the women reported experiencing the same level of pain in both rounds. The proportion of women reporting more severe pain at follow-up exceeded the proportion reporting less severe pain by two percentage points in the comparison groups and by 11 percentage points in the sterilization group (including women who reported a decrease after having their IUD removed). Among the 391 sterilized women who had not used the pill or the IUD, the proportion reporting an increase in the severity of pain exceeded the proportion reporting a decrease in pain by 16 percentage points (p=0.0001); in the comparison groups, there were no significant changes between baseline and follow-up. Among sterilized women who had had natural cycles, eight percent with no pain at baseline had developed some degree of pain by follow-up, with the proportion reporting severe menstrual pain increasing by six percentage points and the proportion reporting moderate pain rising by four percentage points. There was no net increase in any degree of severity among women in the comparison groups. There was some net increase between baseline and follow-up in the proportion of women reporting increased poststerilization pelvic pain that was unrelated to menstruation; however, the increase was significant only among women with natural cycles (p=0.0045). Multivariate analysis showed that the degree of menstrual pain, nonmenstrual pelvic pain and menstrual bleeding at baseline were significantly predictive of their levels at follow-up, and that tubal sterilization was significantly associated with postoperative menstrual pain, but not with pelvic pain or increased menstrual bleeding.

The investigators note that half of the women studied reported no change in the degree of menstrual pain they experienced after sterilization, but among the half that did, the proportion reporting an increase in pain exceeded the proportion reporting a decrease by 16 percentage points. Nevertheless, they comment that their findings "do not negate or diminish the importance or benefits of tubal sterilization, but serve as a focus for future investigations." Overall, because the levels of menstrual pain, pelvic pain and menstrual bleeding at baseline were significantly predictive of their levels at follow-up, the investigators conclude that "women with these gynecologic problems are likely to keep having them . . . regardless of whether they undergo sterilization."—*F. Althaus*

Reference

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Fertility of Immigrants From Asia and Pacific Shifts Toward U.S. Norm

Between 1965 and 1980, the fertility of Asians and Pacific Islanders living in the United States fell substantially. According to U.S. census data, fertility among Pacific Islanders* decreased precipitously, while among Asians,† who as a group initially had fertility rates lower than those of the

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*The Pacific Island groups were Hawaiians, Samoans, Tongans, other Polynesians, Guamanians, other Micronesians, Melanesians and others. Samoans born in Western Samoa and Guamanians born in the Philippines are classified as foreign-born; those born in American Samoa and Guam are considered U.S. born.

†The Asian groups were Chinese, Filipinos, Japanese, Indians, Koreans, Vietnamese, Laotians, Thais, Cambodians, Pakistanis, Indonesians, Hmongs and others.

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Pacific Islanders, trends were similar to those of the United States as a whole. Within each group, fertility was generally lower among those who lived in urban areas, those who were more highly educated, those who were born in the United States and those who were established rather than recent immigrants.[1]

The 1980 census counted about 3.5 million Asians and nearly 260,000 Pacific Islanders living in the United States. Members of racial groups in these two broad categories were identified according to their responses to the census question on race.* For persons who did not respond to that question, answers were assigned by computer according to entries from other household members or to the Census Bureau's general allocation process for missing entries.

Among the Asians, Chinese constituted the largest group (812,178), followed by Filipinos (781,894) and Japanese (716,331). Together, these three groups made up 67 percent of the U.S. Asian population in 1980. Asian Indians (387,223), Koreans (357,393) and Vietnamese (245,025) made up another 29 percent of the U.S. Asian population, with the balance consisting of Laotians, Thais, Cambodians, Pakistanis, Indonesians, Hmongs and others. Hawaiians were the largest group (172,346) of Pacific Islanders in the United States in 1980, followed by Samoans (39,520) and Guamanians (30,695). There were no other Pacific Island groups with more than 10,000 persons living in the United States at that time.

Estimates of fertility among Asians and Pacific Islanders were based on the 19 percent population sample to whom the U.S. census long form (which collected data about urban or rural residence, educational attainment, place of birth and year of immigration) had been administered. The researchers used these data to estimate age-specific fertility rates for the periods 1965–1969, 1970–1974 and 1975–1979, and calculated total fertility rates (TFRs) from these rates.

Overall, Asian fertility declined slightly: The TFR for Asians living in the U.S., which was estimated to be about 2.4 lifetime births per woman in 1965–1969, had fallen to about 1.9 children per woman by 1975–1979. Among the Chinese and the Japanese, the TFR dropped to 1.6 and 1.4 lifetime births per woman, respectively, during the same period. There were slight declines among Filipinos and Koreans, to replacement-level rates of 2.1 and 2.2 children per woman, respectively. The TFR among Vietnamese Americans was comparatively high (5.4 lifetime births per woman) in 1965–1969, but had dropped by 50 percent—to 2.7 children per woman—by 1975–1979.

The TFR for Pacific Islanders as a whole decreased from 3.7 children per woman in 1965–1969 to 2.5 children per woman in 1975–1979. Guamanians experienced the greatest decrease, from 4.0 in 1965–1969 to 2.1 in 1975–1979. During the same period, the TFR among Hawaiians dropped from 3.3 to 2.3, and the rate among Samoans dropped from 6.1 to 3.8. Of all the major Asian and Pacific Islander groups, only the Samoans had a TFR greater than three in 1980.

In comparison, the TFR for the United States as a whole declined from 2.6 children per woman in 1965–1969 to 1.8 in 1975–1979. During that period, total fertility fell from 2.5 to 1.7 among whites, from 3.2 to 2.1 among blacks and from 3.4 to 2.4 among American Indians. Thus, fertility patterns among Asians in the United States were very much like those in the country overall, while fertility among Pacific Islanders, which was at a much higher level than that of the other two groups in 1965–1969, fell sharply.

Rural fertility was higher than urban fertility, both for the United States as a whole and for all its Asian and Pacific Islander populations except Samoans, for whom urban fertility was higher than rural fertility. This situation may reflect high urban concentrations of recent Samoan immigrants with higher fertility. Within each residence category, the TFR fell over all three periods in all groups except urban Indians and rural Koreans, whose fertility increased slightly.

For the United States as a whole and for all individual Pacific Islander and Asian racial groups—except Koreans in 1965–1969—fertility was lower in all three periods among those with more education than among those with less. The fertility of Vietnamese and Guamanians varied much more by education than did that of the U.S. population as a whole; for other groups, the differentials were similar to the U.S. norm. Overall, fertility differences by education tended to lessen over time. Fertility declined among almost every education group over the three periods for the United States as a whole and for the individual racial groups; Koreans with fewer than 12 years of education were the single exception, as their fertility increased slightly. Japanese and Guamanians with more than 12 years of education had the lowest TFR (1.3 children per woman) of all race-education groups; if maintained, such a level of fertility would lead to a long-term population decrease of 40 percent per generation.

The fertility of both U.S.-born and foreign-born Asians and Pacific Islanders decreased over the three time periods (except that of foreign-born Indians, which increased slightly). The fertility of native-born Asians and Pacific Islanders was lower than the fertility of those who were foreign-born, except among Filipinos and Japanese during 1965–1969. The fertility of native-born Chinese and Japanese had dropped to 1.2 children per woman by 1975–1979.

Except among Indians immigrating after 1965 (whose fertility increased slightly), fertility declined over the entire 15-year period among both pre-1965 and post-1965 immigrants. In 1970–1979, the fertility of those who had immigrated after 1965 was generally higher than that of the earlier immigrants. The differential was particularly great among the Vietnamese: For example, in 1975–1979, the TFR for recent immigrants was 2.7 births per woman, compared with a rate of 1.3 births per woman among the earlier immigrants. In comparison, during that same period, TFRs among both Japanese and Chinese Americans were 1.8 for those who had immigrated after 1965 and 1.4 for those who had immigrated earlier.

The authors conclude that the substantial drop in fertility rates among Pacific Islanders living in the United States supports the idea that "social, economic, political, and cultural assimilation should lead to assimilation in . . . fertility behavior as well." The authors also observe that although the fertility patterns of most of the groups studied did not differ greatly from those of the United States as a whole, "moderate fertility differences nevertheless persist in most cases, indicating that the assimilation process in fertility behavior is not yet complete."—*F. Althaus*

Reference

1. R. D. Retherford and M. J. Levin, "Is the Fertility of Asian and Pacific Islander Americans Converging to the U.S. Norm?" *Asian and Pacific Forum,* 3:21, 1989.

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*Although the term "ethnic group" would be more appropriate for some groups, this study retained the Census Bureau terminology that was used during data collection.

Books in Review

Reproductive Rights—and Wrongs

Reproductive Laws for the 1990s
ed. by Sherrill Cohen and Nadine Taub, Humana Press, Clifton, N.J., 1989, $34.50, 458 pp.

Reviewed by R. Alta Charo

The Project on Reproductive Laws for the 1990s, an effort based at Rutgers University and operated with university and foundation support, has published a highly readable and thoughtful survey of public policy debates concerning abortion, prenatal screening, "the fetus as patient," reproductive hazards in the workplace, interference with reproductive choice and alternative modes of reproduction.

Each contribution—in the form of a position paper or commentary—was written by a different author, resulting in occasional overlaps in coverage. The position papers are generally followed by legislative proposals, model statutes, suggested course curricula and even model jury instructions. These additions are exceedingly valuable, even for those who disagree with the substance of the positions taken, because they allow the reader to assess the workability of the proposals. To their credit, the editors include a critique by two congressional aides on one model statute concerning reproductive hazards in the workplace.

Some of the proposals are, indeed, exceedingly broad (usually those calling for greater funding of services). Others fail to acknowledge that laws concerning particular issues already exist but are unworkable for reasons other than those the proposals address. For example, one position paper proposes that "legal remedies should be available for overuse of technologies just as malpractice suits currently result in recoveries for underuse of technology" [p. 41]. In fact, malpractice litigation would already permit such a claim. But defining overuse is quite difficult when economic incentives encourage overuse (via insurance reimbursement plans and malpractice premiums) and damages from overuse are difficult to identify or prove.

Likewise, this paper proposes that "attempts should be made to identify and prohibit experimental procedures that are potentially harmful. All other experimentation should have rigorous standards of informed consent" [p. 41]. This is, in fact, essentially the same standard under which drugs are currently reviewed by the Food and Drug Administration, and all federally funded and nearly all university-based experiments using human subjects require informed consent and are evaluated in advance by institutional review boards.

The editors placed special emphasis on the needs and rights of women of color and women with disabilities by giving issues concerning them prominent positions in the book. This is a laudable change from the norm, in which authors discuss abortion, reproductive technologies and even genetic screening for hundreds of pages before giving an obligatory nod in the direction of these "special interest groups." The authors of these papers point out that such categories can hardly be labeled "special interests," given the large number of women falling within them.

Adrienne Asch's fine contribution on "Reproductive Technology and Disability" acknowledges the difficulties created by our growing ability to screen for disease and disability in fetuses and neonates. While recognizing that certain disabilities can hardly be viewed neutrally—because no one is likely to want to be blind or deaf or paraplegic—Asch argues convincingly that most of the disadvantages associated with these disabilities arise from society's response (or lack thereof) to the needs of such persons. Thus prenatal counselors cannot be truly helpful to their clients until they have been educated about the financial and other types of assistance available to parents of children with disabilities. Only when counselors convey this information can adults be expected to make reasonable decisions about their reproductive future. Rather than recommending limitations on genetic screening, Asch urges that counseling be delivered in a way that does not exacerbate our national intolerance for those with disabilities.

Another particularly good introduction to a growing problem is Janet Gallagher's paper on "the fetus as patient," which is accompanied by commentaries by Deborah Kaplan, Alan Fleischman and John Robertson. In a recent spate of cases around the United States, women have had to undergo caesarean sections against their will to satisfy court-sanctioned physician recommendations based on the probable needs of the fetus. Other cases have involved incarceration of women during pregnancy to bar their access to fetus-damaging drugs and postbirth prosecutions for "fetal abuse" or for "delivering a controlled substance" to the fetus via the umbilical cord and bloodstream. The various pieces touch on the historical context in which these cases arose: that is, the long-held view of women primarily as sources of nurture for children, resulting in a devaluation of their own interests and rights when these conflict with their roles as bearers and caretakers of children. This theme deserved more development, for it runs through most of the rest of the book, playing an important role in such diverse topics as restrictive employment rules aimed at protecting women's reproductive health at the expense of their livelihood, time limits on abortion and conditions for commercialized childbearing such as surrogacy. The theme is also implicit in discussions about the moral and legal duty owed to a fetus that a woman has decided to

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bring to term. It is understood in U.S. law that although one may be under a moral duty to rescue someone at need, that duty is not usually legally enforceable.

Whether a pregnant woman should be required to sacrifice her constitutional right of autonomy on behalf of her fetus cannot be discussed sensibly without consideration of the special relationship between mother and child. The more society views birth as a roll of the dice, the less it considers special restrictions on women's behavior during pregnancy as valid. But viewing parenting and childbirth as more controlled experiences, to be optimally timed, financed and medically managed, fosters a climate in which such special restrictions seem appropriate. Family planning and prenatal diagnosis, while undoubtedly essential to women's reproductive autonomy, have unfortunately been part of what creates this climate. Even this would not be a problem if women were seen as human beings with many, equally important public and private roles. But, when viewed primarily as childbearers, women who fail to take advantage of all opportunities to control the outcome of their pregnancy are failures at their most important task.

The first piece in the book, Laurie Nsiah-Jefferson's discussion of "Reproductive Laws, Women of Color, and Low-Income Women," tackles some portion of this issue when she discusses the financial and geographic obstacles women of color and low-income women face in trying to attain the optimal circumstances for pregnancy and childbirth. These same obstacles resurface in Nan Hunter's description of the forces that lead to late abortions. This discussion could also have mentioned a major psychological difference between middle-class and underclass women. The latter, faced with arbitrary job rejections based on race and sex, with landlords who shut off the heat or with unexpected (and uninsured) illnesses that drain the family food budget, may well view life as an essentially uncontrollable series of events to which they must adapt if they are to survive. Middle-class women, on the other hand, have access to more resources (time, money, husbands and homes), enabling them to influence events to achieve their goals. To judge both groups by the same standards of legal duty to their fetuses is to ignore the different realities of their lives.

An acknowledgment of the diversity of life experiences would also have enhanced Lori Andrews' concise and informative overview of reproductive technologies. Andrews, who bases her case for a feminist approach to reproductive technologies on enhancement of personal choice and deference to personal decision, argues that commercialized surrogacy deserves legal recognition and protection. To demonstrate that surrogates are not a needy, exploited population, she points to the bourgeois aspirations of Mary Beth Whitehead and Kim Cotten (their respective desires to pay children's private school fees and to redecorate a home) that led them to seek employment as surrogates. But this ignores the very real and documented discrepancy in education and income between surrogates and those who hire them. Further, it evades one key element of the surrogacy debate. Even granting that adults ought to be able to make informed decisions to risk their health or emotional well-being for wages, are there areas of our lives that we wish to be beyond the pale of commercial valuation? It is a debate that is pertinent to prostitution, pornography and the sale of body organs.

Moreover, does the practice of commercial surrogacy, which matches strangers with surrogates, perpetuate a dehumanizing view of women as little more than "alternative reproductive vehicles," "rented uteruses" and "fetal containers," as they have been referred to in various surrogacy cases and commentaries? While surrogacy between friends and neighbors forces the intended parents to deal with the surrogate as a whole human being with aspirations, doubts and emotions, commercialized surrogacy encourages them to view surrogates simply as manufacturing sites—factories to produce the object of their desire.

If this volume had included a section on international responses to these trends in reproductive rights law, some of these larger questions might have been addressed more explicitly. The United States is unique in its tolerance of commercialized reproduction and in its rapidly accelerating movement toward dominance of fetal rights over maternal rights, even to the point of condoning prebirth incarceration. Other countries have rejected these trends. Concerns over public morality have focused more on protecting society from gross commercialization or protecting women from renewed stereotyping, and less on the sanctity of fetal life.

Another valuable addition would have been more material on contraception and sterilization. Although both subjects are mentioned throughout the book, neither gets the extensive treatment it deserves. In view of the recommendations for more spending on contraceptive counseling, I would have welcomed more attention to the psychological and sociological reasons why contraceptives are not used even when they are readily available. This problem is no less thorny in the United States than it is in the developing world.

Despite these gaps, the book provides a valuable overview of the law governing reproductive health hazards in the workplace, reproductive technologies for conception and gestation and selected topics in prenatal screening and abortion. As the papers were initially prepared between 1985 and 1987, the volume is slightly dated by recent Supreme Court decisions concerning abortion laws here and U.S. funding for abortion counseling abroad, as well as by the controversy over RU 486, the publication of congressional and state reports on reproductive technologies, China's eugenic sterilization laws and circuit court opinions upholding employment-based fetal protection policies.

Nevertheless, this book is an excellent resource for college, law, public administration and graduate courses on reproductive rights. It is also a valuable introduction for lawyers and policy analysts to the intertwining themes raised by the medical and social controls placed on human reproduction. Although it will not replace the many articles and books written on various aspects of these topics, it fills a distinct niche in the literature both by its breadth of coverage and by its specific proposals for legislative action.

Correction

In "When Urban Adolescents Choose Abortion: Effects on Education, Psychological Status and Subsequent Pregnancy," by Laurie Schwab Zabin, Marilyn B. Hirsch and Mark R. Emerson [**21**:248, 1989], the last three reference numbers in the text do not match the citations in the reference section at the end of the article. The second reference 30 in the text should be to reference 31, text reference 31 should be to reference 32 and text reference 32 should be to reference 33.

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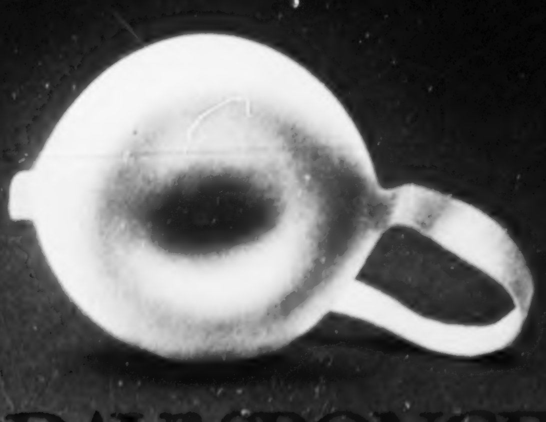

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REFERENCES: 1. McClure DA, Edelman DA: Worldwide method effectiveness of the Today® vaginal contraceptive sponge. *Adv Contracept* 1:305-311, 1985. 2. North BB, Vorhauer BW: Use of the Today® contraceptive sponge in the United States. *Int J Fertil* 30:81-84, 1985.

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Family Planning Perspectives

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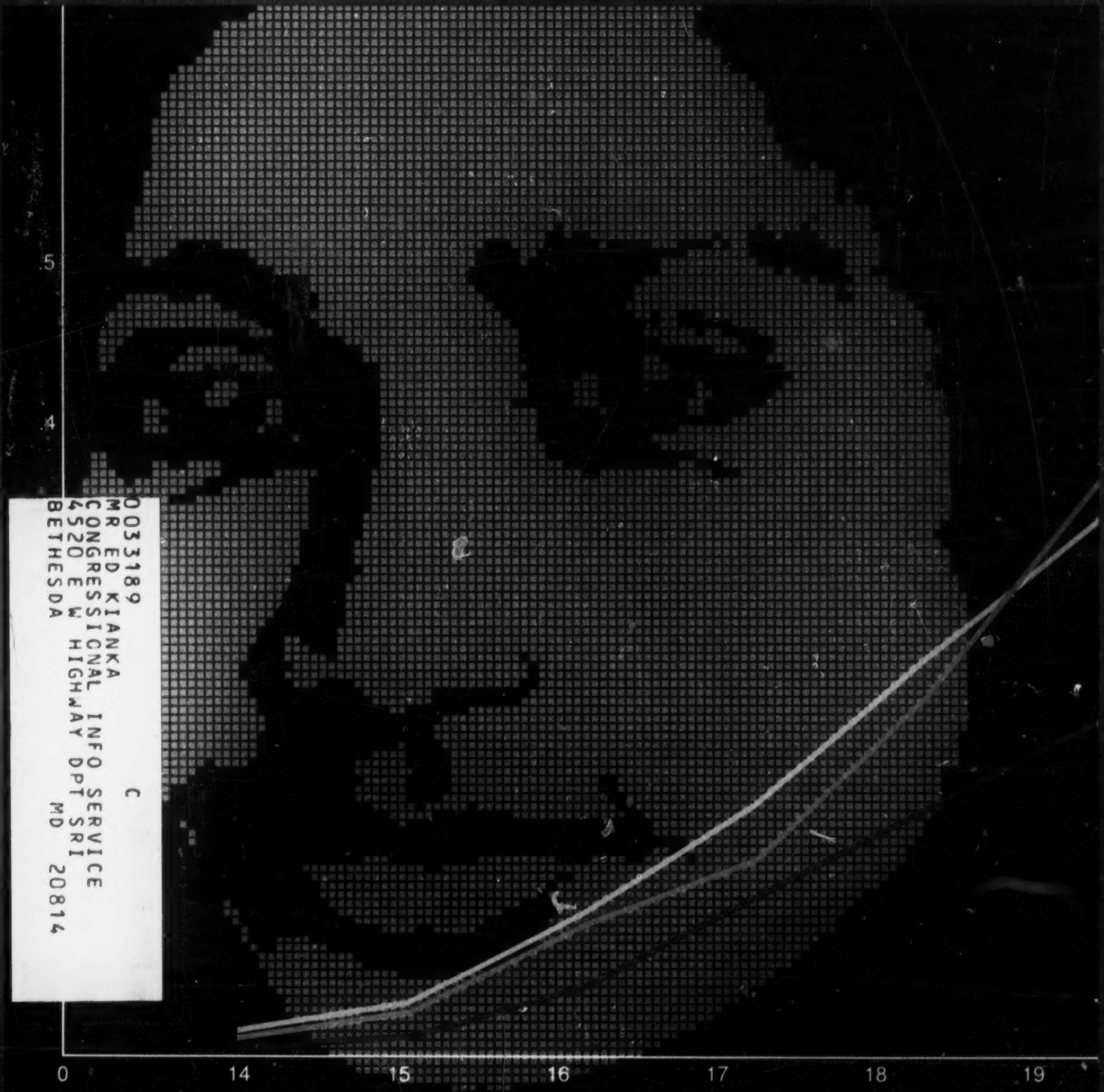
The Status of Abortion Around the World

Two Generations of Teenage Childbearing



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WARNINGS

Cigarette smoking increases the risk of serious cardiovascular side effects from oral contraceptive use. This risk increases with age and with heavy smoking (15 or more cigarettes per day) and is quite marked in women over 35 years of age. Women who use oral contraceptives should be strongly advised not to smoke.

The use of oral contraceptives is associated with increased risk of several serious conditions including thromboembolism, stroke, myocardial infarction, hepatic adenoma, gallbladder disease, and hypertension. Practitioners prescribing oral contraceptives should be familiar with the following information relating to these risks.

1. *Thromboembolic Disorders and Other Vascular Problems:* An increased risk of thromboembolic and thrombotic disease associated with the use of OCs is well established. Three principal studies in Great Britain and three in the United States have demonstrated an increased risk of fatal and nonfatal venous thromboembolism and stroke, both hemorrhagic and thrombotic. These studies estimate that users of OCs are 4 to 11 times more likely than nonusers to develop these diseases without evident cause. **Cerebrovascular Disorders:** In a collaborative American study of cerebrovascular disorders in women with and without predisposing causes, it was estimated that the risk of hemorrhagic stroke was 2.0 times greater in users than in nonusers and the risk of thrombotic stroke was 4 to 9.5 times greater in users than in nonusers. **Myocardial Infarction:** An increased risk of myocardial infarction associated with the use of OCs has been reported, confirming a previously suspected association. These studies, conducted in the United Kingdom, found, as expected, that the greater the number of underlying risk factors for coronary artery disease (cigarette smoking, hypertension, hypercholesterolemia, obesity, diabetes, history of preeclamptic toxemia), the higher the risk of developing myocardial infarction, regardless of whether the patient was an OC user or not. OCs, however, were found to be a clear additional risk factor. In terms of relative risk, it has been estimated that OC users who do not smoke (smoking is considered a major predisposing condition to myocardial infarction) are about twice as likely to have a fatal myocardial infarction as nonusers who do not smoke. OC users who are also smokers have about a 5-fold increased risk of fatal infarction compared to users who do not smoke, but about a 10- to 12-fold increased risk compared to nonusers who do not smoke. Furthermore, the amount of smoking is also an important factor. In determining the importance of these relative risks, however, the baseline rates for various age groups must be given serious consideration. The importance of other predisposing conditions mentioned above in determining relative and absolute risks has not as yet been quantified; it is quite likely that the same synergistic action exists, but perhaps to a lesser extent. **Risk of Dose:** In an analysis of data derived from several national adverse reaction reporting systems, British investigators concluded that the risk of thromboembolism, including coronary thrombosis, is directly related to the dose of estrogen used in oral contraceptives. Preparations containing 100 mcg or more of estrogen were associated with a higher risk of thromboembolism than those containing 50 to 80 mcg of estrogen. Their analysis did suggest, however, that the quantity of estrogen may not be the sole factor involved. This finding has been confirmed in the United States. Careful epidemiological studies to determine the degree of thromboembolic risk associated with progestogen-only OCs have not been performed. Cases of thromboembolic disease have been reported in women using these products, and they should not be presumed to be free of excess risk. **Persistence of Risk:** In confirmation of earlier reports, two studies have suggested that an increased risk may persist for as long as 6 years after discontinuation of oral contraceptive use for cerebrovascular disease and 9 years for myocardial infarction. In addition, a prospective study suggested the persistence of risk for subarachnoid hemorrhage. **Estimate of Excess Mortality from Circulatory Diseases:** A large prospective study carried out in the U.K. estimated the mortality rate per 100,000 women per year from diseases of the circulatory system for users and nonusers of OCs according to age, smoking habits, and duration of use. The overall excess death rate annually from circulatory diseases for OC users was estimated to be 20 per 100,000 (ages 15 to 34 – 5/100,000; ages 35 to 44 – 33/100,000; ages 45 to 49 – 140/100,000), the risk being concentrated in older women, in those with a long duration of use, and in cigarette smokers. It was not possible, however, to examine the interrelationships of age, smoking, and duration of use, nor to compare the effects of continuous versus intermittent use. Although the study showed a 10-fold increase in death due to circulatory diseases in users for 5 or more years, all of these deaths occurred in women 35 or older. Until larger numbers of women under 35 with continuous use for 5 or more years are available, it is not possible to assess the magnitude of the relative risk for this younger age group. The available data from a variety of sources have been analyzed to estimate the risk of death associated with various methods of contraception. The estimates of risk of death for each method include the combined risk of the contraceptive method (eg, thromboembolic and thrombotic disease in the case of oral contraceptives) plus the risk attributable to pregnancy or abortion in the event of method failure. This latter risk varies with the effectiveness of the contraceptive method. The study concluded that the mortality associated with all methods of birth control is low and below that associated with childbirth, with the exception of OCs in women over 40 who smoke. (The rates given for pill only/smokers for each age group are for smokers as a class. For "heavy" smokers [more than 15 cigarettes a day] the rates given would be about double; for "light" smokers [less than 15 cigarettes a day] about 50 percent.) The lowest mortality is associated with the condom or diaphragm backed up by early abortion. The risk of thromboembolic and thrombotic disease associated with OCs increases with age after approximately age 30 and, for myocardial infarction, is further increased by hypertension, hypercholesterolemia, obesity, diabetes, or history of preeclamptic toxemia and especially by cigarette smoking. The physician and the patient should be alert to the earliest manifestations of thromboembolic and thrombotic disorders (eg, thrombophlebitis, pulmonary embolism, cerebrovascular insufficiency, coronary occlusion, retinal thrombosis, and mesenteric thrombosis). Should any of these occur or be suspected, the drug should be discontinued immediately. A four- to six-fold increased risk of postsurgery thromboembolic complications has been reported in OC users. If feasible, OCs should be discontinued at least 4 weeks before surgery of a type associated with an increased risk of thromboembolism or prolonged immobilization. 2. *Ocular Lesions:* There have been reports of neuro-ocular lesions, such as optic neuritis or retinal thrombosis, associated with the use of OCs. Discontinue OC medication if there is unexplained, sudden or gradual, partial or complete loss of vision; onset of proptosis or diplopia; papilledema; or retinal vascular lesions, and institute appropriate diagnostic and therapeutic measures. 3. *Carcinoma:* Long-term continuous administration of either natural or synthetic estrogen in certain animal species increases the frequency of carcinoma of the breast, cervix, vagina, and liver. Certain synthetic progestogens, none currently contained in OCs, have been noted to increase the incidence of mammary nodules, benign and malignant, in dogs. In humans, three case control studies have reported an increased risk of endometrial carcinoma associated with the prolonged use of exogenous estrogen in postmenopausal women. One publication reported on the first 21 cases submitted by physicians to a registry of cases of adenocarcinoma of the endometrium in women under 40 on OCs. Of the cases found in women without predisposing risk factors for adenocarcinoma of the endometrium (eg, irregular bleeding at the time OCs were first given, polycystic ovaries), nearly all occurred in women who had used a sequential OC. These products are no longer marketed. No evidence has been reported suggesting an increased risk of endometrial cancer in users of conventional combination or progestogen-only OCs. Several studies have found no increase in breast cancer in women taking OCs or estrogens. One study, however, while also noting no overall increased risk of breast cancer in women treated with OCs, found an excess risk in the subgroups of OC users with documented benign breast disease. A reduced occurrence of benign breast tumors in users of OCs has been well-documented. In summary, there is at present no confirmed evidence from human studies of an increased risk of cancer associated with OCs. Close clinical surveillance of all women taking OCs is, nevertheless, essential. In all cases of undiagnosed persistent or recurrent abnormal vaginal bleeding, appropriate diagnostic measures should be taken to rule out malignancy. Women with a strong family history of breast cancer or who have breast nodules, fibrocystic disease, or abnormal mammograms should be monitored with particular care if they elect to use OCs instead of other methods of contraception. 4. *Hepatic Tumors:* Benign hepatic adenomas have been found to be associated with the use of OCs. One study showed that OC formulations with high hormonal potency were associated with a higher risk than lower potency formulations. Although benign, hepatic adenomas may rupture and may cause death through intra-abdominal hemorrhage. This has been reported in short-term as well as long-term users of OCs. Two studies relate risk with duration of use of the contraceptive, the risk being much greater after 4 or more years of OC use. While hepatic adenoma is a rare lesion, it should be considered in women presenting abdominal pain and tenderness, abdominal mass or shock. A few cases of hepatocellular carcinoma have been reported in women taking oral contraceptives. The relationship of these drugs to this type of malignancy is not known at this time. 5. *Use in or Immediately Preceding Pregnancy, Birth Defects in Offspring, and Malignancy in Female Offspring:* The use of female sex hormones – both estrogenic and progestational agents – during early pregnancy may seriously damage the offspring. It has been shown that females exposed *in utero* to diethylstilbestrol, a nonsteroidal estrogen, have an increased risk of developing in later life a form of vaginal or cervical cancer that is ordinarily extremely rare. This risk has been estimated to be of the order of 1 in 1,000 exposures or less. Although there is no evidence at the present time that OCs further enhance the risk of developing this type of malignancy, such patients should be monitored with particular care if they elect to use OCs instead of other methods of contraception. Furthermore, a high percentage of such exposed women (from 30% to 90%) have been found to have epithelial changes of the vagina and cervix. Although these changes are histologically benign, it is not known whether this condition is a precursor of vaginal malignancy. Male children so exposed may develop abnormalities of the urogenital tract. Although similar data are not available with the use of other estrogens, it cannot be presumed that they would not induce similar changes. An increased risk of congenital anomalies, including heart defects and limb defects, has been reported with the use of sex hormones, including OCs, in pregnancy. One case control study has estimated a 4.7-fold increase in risk of limb-reduction defects in infants exposed *in utero* to sex hormones (OCs, hormonal withdrawal tests for pregnancy or attempted treatment for threatened abortion). Some of these exposures were very short and involved only a few days of treatment. The data suggest that the risk of limb-reduction defects in exposed fetuses is somewhat less than 1 in 1,000 live births. In the past, female sex hormones have been used during pregnancy in an attempt to treat threatened or habitual abortion. There is considerable evidence that estrogens are ineffective for these indications, and there is no evidence from well-controlled studies that progestogens are effective for these uses. There is some evidence that triploidy and possibly other types of polyploidy are increased among abortuses from women who become pregnant soon after ceasing OCs. Embryos with these anomalies are virtually always aborted spontaneously. Whether there is an overall increase in spontaneous abortion of pregnancies conceived soon after stopping OCs is unknown. It is recommended that for any patient who has missed two consecutive periods, pregnancy should be ruled out before continuing the contraceptive regimen. If the patient has not adhered to the prescribed schedule, the possibility of pregnancy should be considered at the time of the first missed period, and further use of OCs should be withheld until pregnancy has been ruled out. If pregnancy is confirmed, the patient should be apprised of the potential risks to the fetus and the advisability of continuation of the pregnancy should be discussed in the light of these risks. It is also recommended that women who discontinue oral contraceptives with the intent of becoming pregnant use an alternate form of contraception for a period of time before attempting to conceive. Many clinicians recommend 3 months although no precise information is available on which to base this recommendation. The administration of progestogen-only or progestogen-estrogen combinations to induce withdrawal bleeding should not be used as a test of pregnancy. 6. *Gallbladder Disease:* Studies report an increased risk of surgically confirmed gallbladder disease in users of OCs and estrogens. In one study, an increased risk appeared after 2 years of use and doubled after 4 or 5 years of use. In one of the other studies, an increased risk was apparent between 6 and 12 months of use. 7. *Carbohydrate and Lipid Metabolic Effects:* A decrease in glucose tolerance has been observed in a significant percentage of patients on OCs. For this reason, prediabetic and diabetic patients should be carefully observed while receiving OCs. An increase in triglycerides and total phospholipids has been observed in patients receiving OCs. The clinical significance of this finding remains to be defined. 8. *Elevated Blood Pressure:* An increase in blood pressure has been reported in patients receiving OCs. In some women, hypertension may occur within a few months of beginning OC use. In the first year of use, the prevalence of women with hypertension is low in users and may be no higher than that of a comparable group of nonusers. The prevalence in users increases, however, with longer exposure, and in the fifth year of use is two and a half to three times the reported prevalence in the first year. Age is also strongly correlated with the development of hypertension in OC users. Women who previously have had hypertension during pregnancy may be more likely to develop elevation of blood pressure when given OCs. Hypertension that develops as a result of taking OCs usually returns to normal after discontinuing the drug. 9. *Headache:* The onset or exacerbation of migraine or development of headache of a new pattern which is recurrent, persistent, or severe, requires discontinuation of OCs and evaluation of the cause. 10. *Bleeding Irregularities:* Breakthrough bleeding, spotting and amenorrhea are frequent reasons for patients discontinuing OCs. In breakthrough bleeding, as in all cases of irregular bleeding from the vagina, nonfunctional causes should be borne in mind. In undiagnosed persistent or recurrent abnormal bleeding from the vagina, adequate diagnostic measures are indicated to rule out pregnancy or malignancy. If pathology has been excluded, time or a change to another formulation may solve the problem. Changing to an OC with a higher estrogen content, while potentially useful in minimizing menstrual irregularity, should be done only if necessary since this may increase the risk of thromboembolic disease. Women with a past history of oligomenorrhea or secondary amenorrhea or young women without regular cycles may have a tendency to remain anovulatory or to become amenorrheic after discontinuation of OCs. Women with these preexisting problems should be advised of this possibility and encouraged to use other contraceptive methods. Post-use anovulation, possibly prolonged, may also occur in women without previous irregularities. 11. *Ectopic Pregnancy:* Ectopic as well as intrauterine pregnancy may occur in contraceptive failures. However, in progestogen-only OC failures, the ratio of ectopic to intrauterine pregnancies is higher than in women who are not receiving OCs, since the drugs are more effective in preventing intrauterine than ectopic pregnancies. 12. *Breast Feeding:* OCs given in the postpartum period may interfere with lactation. There may be a decrease in the quantity and quality of the breast milk. Furthermore, a small fraction of the hormonal agents in OCs has been identified in the milk of mothers receiving these drugs. The effects, if any, on the breast-fed child have not been determined. If feasible, the use of OCs should be deferred until the infant has been weaned. **PRECAUTIONS: General:** 1. A complete medical and family history should be taken prior to the initiation of OCs. The pretreatment and periodic physical examinations should include special reference to blood pressure, breasts, abdomen and pelvic organs, including Papanicolaou smear and relevant laboratory tests. As a general rule, OCs should not be prescribed for longer than 1 year without another physical examination being performed. 2. Under the influence of estrogen-progestogen preparations preexisting uterine leiomyomata may increase in size. 3. Patients with a history of psychic depression should be carefully observed and the drug discontinued if depression recurs to a serious degree. Patients becoming significantly depressed while taking OCs should stop the medication and use an alternate method of contraception in an attempt to determine whether the symptom is drug related. 4. OCs may cause some degree of fluid retention. They should be prescribed with caution, and only with careful monitoring, in patients with conditions which might be aggravated by fluid retention, such as convulsive disorders, migraine syndrome, asthma, or cardiac or renal insufficiency. 5. Patients with a past history of jaundice during pregnancy have an increased risk of recurrence of jaundice while receiving OC therapy. If jaundice develops in any patient receiving such drugs, the medication should be discontinued. 6. Steroid hormones may be poorly metabolized in patients with impaired liver function and should be administered with caution in such patients. 7. OC users may have disturbances in normal tryptophan metabolism which may result in a relative pyridoxine deficiency. The clinical significance of this is yet to be determined. 8. Serum folate levels may be depressed by OC therapy. Since the pregnant woman is predisposed to the development of folate deficiency and the incidence of folate deficiency increases with increasing gestation, it is possible that if a woman becomes pregnant shortly after stopping OCs, she may have a greater chance of developing folate deficiency and complications attributed to this deficiency. 9. The pathologist should be advised of OC therapy when relevant specimens are submitted. 10. Certain endocrine and liver function tests and blood components may be affected by estrogen-containing OCs: a. Increased sulfobromophthalein retention. b. Increased prothrombin and factors VII, VIII, IX, and X; decreased antithrombin 3; increased norepinephrine-induced platelet aggregability. c. Increased thyroid binding globulin (TBG) leading to increased circulating total thyroid hormone, as measured by protein bound iodine (PBI), T4 by column, or T4 by radioimmunoassay. Free T3 resin uptake is decreased, reflecting the elevated TBG; free T4 concentration is unaltered. d. Decreased pregnanediol excretion. e. Reduced response to metyrapone test. **INFORMATION FOR THE PATIENT:** See Patient Labeling. **DRUG INTERACTIONS:** Reduced efficacy and increased incidence of breakthrough bleeding have been associated with concomitant use of rifampin. A similar association has been suggested with barbiturates, phenylbutazone, phenytoin sodium, tetracycline, and ampicillin. **CARCINOGENESIS, PREGNANCY, NURSING MOTHERS:** See Contraindications and Warnings sections. **ADVERSE REACTIONS:** An increased risk of the following serious adverse reactions has been associated with the use of OCs (see Warnings): Thrombophlebitis, pulmonary embolism, coronary thrombosis, cerebral thrombosis, cerebral hemorrhage, hypertension, gallbladder disease, benign hepatomas, congenital anomalies. There is evidence of an association between the following conditions and the use of OCs, although additional confirmatory studies are needed: Mesenteric thrombosis, neuro-ocular lesions, eg, retinal thrombosis and optic neuritis. The following adverse reactions have been reported in patients receiving OCs and are believed to be drug related: Nausea and/or vomiting, usually the most common adverse reactions, occur in approximately 10 percent or less of patients during the first cycle. Other reactions, as a general rule, are seen much less frequently or only occasionally: Gastrointestinal symptoms (such as abdominal cramps and bloating), breakthrough bleeding, spotting, change in menstrual flow, dysmenorrhea, amenorrhea during and after treatment, temporary infertility after discontinuance of treatment, edema, chloasma or melasma which may persist, breast changes: tenderness, enlargement and secretion; change in weight (increase or decrease); change in cervical erosion and cervical secretion, possible diminution in lactation when given immediately postpartum, cholestatic jaundice, migraine, increase in size of uterine leiomyomata, rash (allergic), mental depression, reduced tolerance to carbohydrates, vaginal candidiasis, change in corneal curvature (steepening), intolerance to contact lenses. The following adverse reactions have been reported in users of OCs, and the association has been neither confirmed nor refuted: Premenstrual-like syndrome, cataracts, changes in libido, chorea, changes in appetite, cystitis-like syndrome, headache, nervousness, dizziness, hirsutism, loss of scalp hair, erythema multiforme, erythema nodosum, hemorrhagic eruption, vaginitis, porphyria, hemolytic uremic syndrome. **ACUTE OVERDOSE:** Serious ill effects have not been reported following acute ingestion of large doses of OCs by young children. Overdosage may cause nausea, and withdrawal bleeding may occur in females. **HOW SUPPLIED:** Loestrin **21** 1/20 is available in dispensers each containing 21 tablets. Each tablet contains 1 mg of norethindrone acetate and 20 mcg of ethinyl estradiol. Available in packages of five dispensers. Loestrin **Fe** 1/20 is available in dispensers each containing 21 white tablets and 7 brown tablets. 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UPDATE

Adoption Declines in the 1980s

The likelihood of an American couple's adopting a child appears to have declined during the 1980s: A recently released analysis shows that in 1982, 2.2 percent of all U.S. couples had ever adopted a child, compared with 1.7 percent in 1987; the proportions who had adopted an unrelated child fell from 1.7 percent to 1.3 percent over the same period.[1] Older, better educated and higher income couples continue to be most likely to adopt a child. Although whites and blacks are almost equally likely to adopt, whites are more likely than blacks to adopt an unrelated child (1.4 percent vs. 0.8 percent). Hispanic couples, on the other hand, are much less likely than whites or blacks to adopt (0.8 percent) or to adopt an unrelated child (0.4 percent). The study also found that during the 1970s and 1980s, 41 percent of all adoptions were arranged by public agencies, 35 percent by private agencies and 24 percent independently. The percentage of adoptions arranged independently rose from 23 percent in the 1970s to 28 percent in the 1980s.

1. C. A. Bachrach et al., "Adoption in the 1980s," *Advance Data from Vital and Health Statistics*, No. 181, 1990.

Nova T Effective for Up to Five Years

The Nova T, a copper IUD used mainly in Europe, remains highly effective for a full five years of use, according to the results of a recent prospective study conducted in Canada.[1] Among a group of 201 women who began using the device in 1981 and 1982, only six experienced an accidental pregnancy over the course of the next five years; all of the pregnancies occurred during the first two years of use. The Pearl index pregnancy rate at the end of five years was 1.2, and the net pregnancy rate was 3.2 per 100 users after five years. Most expulsions, as well as removals because of infection, were among women under 25, leading the investigators to comment that for women over 25 who are in a stable relationship, the Nova T represents "a most effective contraceptive method."

1. P. Fugere, "Five Years Experience of Intrauterine Contraception with the Nova-T," *Contraception*, **41**:1, 1990.

Nurse-Midwives and Prenatal Care

Pregnant women in South Carolina at high risk of having an underweight baby were no more likely to deliver a low-birth-weight baby if they received prenatal care from a nurse-midwife than if they were seen prenatally by an obstetrician.[1] Nineteen percent and 20 percent, respectively, gave birth to a low-birth-weight infant, a difference that was not statistically significant. Among whites, 16 percent of those seen by a nurse-midwife prenatally and 13 percent of those seen by an obstetrician gave birth to a low-birth-weight baby, while among blacks these proportions were 22 percent and 26 percent; neither of the differences was statistically significant. The investigators observe that "care for women at increased statistical risk of low birth weight can be provided equally well by nurse-midwives [and] by obstetricians."

1. H. C. Heins, Jr., et al., "A Randomized Trial of Nurse-Midwifery Prenatal Care to Reduce Low Birth Weight," *Obstetrics & Gynecology*, **75**:341, 1990.

Amniocentesis and Infant Ear Problems

Babies tested for chromosomal defects in utero by means of amniocentesis are no more likely than untested infants to suffer from a variety of subsequent developmental disabilities, except for a slightly greater potential for ear problems.[1] According to a Canadian study of 100 infants tested by amniocentesis in utero and 56 untested infants, all of whom were examined four years after delivery, there were no significant differences in various measures of their intelligence, visual-motor-perception skills or language ability or of behavioral problems. However, about 75 percent of the children who had been tested by amniocentesis in utero had had ear infections, compared with 58 percent among those who had not been tested. In addition, tested children were more likely to have middle-ear abnormalities; however, they had no increased risk of hearing loss. The investigators hypothesize that removal of fluid from the amniotic sac may induce pressure changes within the fetal ear that disturb anatomical development, but they caution that more research is needed.

1. J. A. K. Finegan et al., "Child Outcome Following Mid-Trimester Amniocentesis: Development, Behaviour, and Physical Status at Age 4 Years," *British Journal of Obstetrics and Gynaecology*, **97**:32, 1990.

Little Progress Toward 1990 STD Aims

Eleven of the national health objectives for 1990 that were established by the U.S. government in 1979 involved sexually transmitted diseases (STDs), and five were designated national priorities. A report from the Centers for Disease Control (CDC) concludes that many of the priority objectives are unlikely to be met.[1] For example, the aim of reducing syphilis rates to seven cases per 100,000 population will not be met; in fact, syphilis rates have climbed to their highest level in 40 years, almost 17 cases per 100,000. The goal of reducing gonorrheal infection rates is likely to be reached, but the CDC report notes that rates are unchanged among blacks and have declined only slightly among teenagers. Two other priority objectives—that 95 percent of health care workers be able to diagnose and treat suspected cases of STDs and that each junior and senior high school student receive accurate information about STDs—are both unlikely to be reached. One other objective, the reduction of cases of gonococcal pelvic inflammatory disease, appears likely to be attained. The report concludes that the rise of AIDS and the advent of crack have contributed greatly to the failure of the health care system to achieve aims thought possible in 1979.

[1] "Progress Toward Achieving the 1990 Objectives for the Nation for Sexually Transmitted Diseases," *Morbidity and Mortality Weekly Report*, **39**:53, 1990.

Breastfeeding and Infant Health

Babies breastfed for 13 or more weeks are significantly less likely to experience gastrointestinal infection than are babies who are bottle-fed in the first 13 weeks of life, and the apparent protection provided by breastfeeding lasts well past the period of breastfeeding itself.[1] An analysis of 674 infants in Scotland revealed that those who were bottle-fed for their first 13 weeks were 12 times more likely than breastfed babies to develop a gastrointestinal infection requiring hospital care during that time; they were also six times more likely to experience a respiratory infection. Furthermore, bottle-fed babies were eight times more likely than breastfed babies to have a gastrointestinal infection 14–26 weeks after birth, four times more likely at 27–39 weeks after birth and almost seven times more likely at 40–52 weeks after birth. The investigators conclude that breastfeeding "still has an important part to play in preventing infection among infants in developed countries," and note that women planning to return to work after having a baby should be encouraged to breastfeed for at least the first three months before introducing bottle-feeding.

[1] P. W. Howie et al., "Protective Effect of Breastfeeding Against Infection," *British Journal of Medicine*, **300**:11, 1990.

Reducing Multiple Pregnancies

The number of fetuses in potentially dangerous multiple gestations can now be safely reduced in utero, with little risk to the remaining fetuses: According to a recent report, in 94 percent of the pregnancies in which a reduction procedure was performed, the remaining fetus or fetuses successfully developed to term.[1] Over a three-year period, 46 women were referred to the investigators for treatment. Fertility drugs had caused a multiple pregnancy in 34 of them, with 18 carrying four or more fetuses. Eight other women had one or more fetuses with a genetic abnormality but at least one normal fetus that they wanted to carry to term; the remaining four did not want to have more than one baby and said they would terminate the entire pregnancy instead. The investigators observe that in pregnancies with five or more fetuses, it is rare that any survive to term, and in triplet and quadruplet gestations there is a high risk of perinatal mortality; thus, a procedure was developed in which potassium chloride is injected into the heart of one or more of the fetuses in a multiple gestation. The tissue of each aborted fetus dissolves and the remaining fetuses continue to develop. In most cases, the procedure was carried out at 9–13 weeks of gestation. Two miscarriages occurred after the procedure—one of the 13 twin pregnancies reduced to one fetus and one of the 32 triplet pregnancies reduced to twins. In addition, the only pregnancy reduced from five fetuses to three ended prematurely, with two of the remaining fetuses dying and one still requiring mechanical respiratory aid six months afterward. The researchers comment that under current law, a woman may end a pregnancy at any time before viability; thus, in cases of multiple gestations that might otherwise be terminated, "the selective procedure at least preserves some fetuses, which is a legitimate public policy interest."

[1] R. J. Wapner et al., "Selective Reduction of Multifetal Pregnancies," *Lancet*, **I**:90, 1990.

Caffeine Intake No Bar to Conception

Contrary to the results of earlier research, data from a combined U.S.–Canadian study show no impact of caffeine consumption on the length of time needed for conception to take place.[1] A total of 2,817 fertile women needed a mean of 4.5 months to become pregnant, and six percent of these women required more than 12 months to conceive. The mean was no greater among women who drank three or more cups of caffeinated coffee each day or seven or more cans of caffeinated cola each week than it was among those who drank little or no coffee or cola. However, women who drank three or more cups of caffeinated tea each day took significantly longer to conceive (5.6 months) than did women who drank little or no tea (4.2 months). An analysis of total caffeine intake that controlled for the effects of personal characteristics and potentially confounding factors showed no association between the monthly amount of caffeine consumed and the time needed to conceive.

[1] M. Riduan Joesoef et al., "Are Caffeinated Beverages Risk Factors for Delayed Conception?" *Lancet*, **I**:136, 1990.

HIV Infection Among Prostitutes

Seven percent of a group of 1,305 female prostitutes recruited from various areas around the United States were seropositive for infection with human T-cell lymphotropic virus type I or type II, according to a recently published study.[1] (Type 1 is believed to be an important coinfection with the human immunodeficiency virus.) However, prevalence rates varied greatly by area, from zero among the 35 prostitutes from southern Nevada to 25 percent among the 59 from Newark, New Jersey. A stepwise logistic regression analysis revealed that when the data were adjusted for a variety of characteristics, race was the most important risk factor, with nonwhites almost five times more likely than whites to be infected; ever-use of intravenous drugs and infection with hepatitis B were associated with a nearly threefold increased risk of infection, and residence in Newark was associated with more than a twofold increased risk. A history of other sexually transmitted diseases, a large number of paying sexual partners, participation in street prostitution, sexual contact with intravenous drug users and never use of oral contraceptives in the past five years were not associated with risk of infection.

[1] R. F. Khabbaz et al., "Seroprevalence and Risk Factors for HTLV-1/2 Infection Among Female Prostitutes in the United States," *Journal of the American Medical Association*, **263**:60, 1990.

The "Say No" Strategy: Does It Work?

By itself, stressing the importance of sexual abstinence may not postpone sexual activity among young teenagers.[1] A total of 191 low-income sixth and seventh graders participated in six weekly sessions emphasizing positive attitudes toward premarital sexual abstinence as well as self-esteem, decision-making skills, assertiveness and goal-setting. A control group of 129 comparable teenagers did not participate in the program but answered the same pretest and posttest questionnaires as the study participants did. By the end of the program, males exposed to it were more likely than male nonparticipants to have engaged in sexual intercourse, and all participants were more likely than nonparticipants to have engaged in noncoital sexual behavior. The researchers conclude that adolescent pregnancy prevention programs "that utilize a single approach (teaching abstinence) may be ineffective."

[1] F. S. Christopher and M. W. Roosa, "An Evaluation of an Adolescent Pregnancy Prevention Program: Is 'Just Say No' Enough?" *Family Relations*, **39**:68, 1990.

The Children of Teenage Mothers: Patterns Of Early Childbearing in Two Generations

By Frank F. Furstenberg, Jr., Judith A. Levine and Jeanne Brooks-Gunn

Nearly two-thirds of the daughters of adolescent mothers delayed their first birth until age 19 or later, but those who had a teenage birth may be more vulnerable than their mothers to economic dependence and less able to escape poverty.

Summary

Twenty years after a mostly black group of Baltimore women became adolescent mothers, the majority of their first-born children had not become adolescent parents, a finding that challenges the popular belief that the offspring of teenage mothers are themselves destined to become adolescent parents. Almost all of the offspring had had intercourse by age 19. About half of the young women had experienced a pregnancy before that age, and approximately one-third of the young men reported having impregnated a partner before age 19. The Baltimore youths were just as likely to have had a live birth before age 19 as were the children of teenage mothers in a national sample of urban blacks, and both of these groups were more likely to have done so than were the children of older mothers in the national sample. In the Baltimore sample, maternal welfare experience only increased a daughter's likelihood of early childbearing if welfare was received during her teenage years.

Within the Baltimore sample, a direct comparison of the daughters who became adolescent mothers with their own mothers at a comparable age reveals that the daughters have bleaker educational and financial prospects than their mothers had, and are less likely to ever have married. These results suggest that today's teenage parents may be less likely than were previous cohorts of adolescent mothers to overcome the handicaps of early childbearing. This trend could portend the growth of an urban underclass, even though only a minority of the offspring of teenage mothers go on to become adolescent parents.

Introduction

Despite a mounting effort to reduce its incidence, teenage childbearing remains a pressing social concern in the United States. Premature parenthood is widely believed to jeopardize seriously the life chances of young mothers and their children, contributing to the impoverishment of this already disadvantaged segment of American society and to the expense of welfare costs associated with early parenthood. The much heralded National Academy of Sciences (NAS) report prepared by the Panel on Adolescent Pregnancy and Childbearing painstakingly documented the public and private costs of early childbearing.[1] Since the report's publication, further information on the link between teenage parenthood and long-term welfare dependency has indicated that early childbearing may be an important mechanism in understanding the intergenerational transmission of disadvantage.[2]

Early nonmarital childbearing is known to be far more common among blacks than among whites, although in the past 15 years the incidence of teenage childbearing has risen most rapidly among young, unmarried whites.[3] Several researchers have argued that the timing of parenthood is a significant source of racial differences in the poverty rate among children and is responsible in part for the growing concentration of poverty in urban areas.[4]

These demographic trends have helped to foster the idea that the offspring of teenage mothers are extremely susceptible to becoming young parents themselves. If they do follow in their parents' footsteps, they will be especially vulnerable to the adverse effects of adolescent parenthood, such as school dropout, economic dependency and high fertility. This concept of a recurrent cycle of disadvantage leading to a growing and self-perpetuating underclass is indeed a frightening prospect.

Although there is a good deal of information indicating that poverty can persist from generation to generation, the few longitudinal studies that have been conducted have produced only equivocal support for this notion.[5] More specific evidence on the recurrence of teenage parenthood from one generation to the next is lacking. Clinicians frequently mention that parents of teenage mothers themselves often began childbearing early, but data on the proportion of the offspring of adolescent mothers who enter parenthood as teenagers are not available. This proportion is assumed to be quite high, but the precise figure is anyone's guess.

This article describes the sexual behavior and fertility of a sample of children of teenage mothers in Baltimore who were followed over a 20-year period. The first part of our analysis reports the incidence of teenage pregnancy and childbearing within this population of young men and

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women. Since the participants in the Baltimore study do not constitute a representative sample, we compare the findings we obtained with data from the National Longitudinal Survey of Youth (NLSY),[6] an ongoing longitudinal study of a nationally representative sample of young adults first interviewed in 1979 at ages 14–21. In the second part of the article, we focus specifically on the daughters who became second-generation teenage mothers.

The Baltimore Study

Between 1966 and 1968, 404 pregnant Baltimore women younger than 18 who had never had a child before were interviewed as part of an evaluation of one of the nation's first comprehensive health care programs for adolescent mothers. The women were reinterviewed one, three, five and 17 years after the initial meeting. Their firstborn children were interviewed at the five-year follow-up (when they were preschoolers), at the 17-year follow-up (when they were in midadolescence) and at a recently completed 20-year follow-up (when they were between the ages of 18 and 21).*

At the 20-year follow-up, 253 youths remained in the sample. Most attrition occurred early in the study and was concentrated among the small segment of the original sample who were white and among the women who left the Baltimore area shortly after childbirth. Of the youths interviewed at the five-year follow-up, 82 percent remained in the study 15 years later.

Although the pregnant adolescents originally studied were not randomly selected, they were similar to the larger population of primarily black women having a first birth before age 18 in Baltimore. Most came from poor families: Half were living in single-parent households at the beginning of the study and one-quarter were on welfare—which, by the standards of the time, represented a substantial level of disadvantage. Their parents' median educational level was 10th grade. Most of their mothers had been teenage parents themselves, half of whom had borne five or more children. Still, about half of the families were working poor, and most did not live in Baltimore's most economically distressed neighborhoods.[7]

The experiences of these young mothers have been extensively described,[8] and we shall make no attempt here to summarize in detail the findings of the five-year or 17-year follow-up studies. The women had generally suffered considerable short-term handicaps as a result of an early first birth, including low levels of education and early employment. The results of the 17-year follow-up provided a picture of greater variability in the consequences of early childbearing. Over the long term, many of the women managed to return to school, leave public assistance and find stable employment; only a small fraction had large families. Nonetheless, barely more than one-third were married, only one-sixth to the father of their first child. In comparison with samples from several national surveys, the Baltimore mothers were clearly not as successful as metropolitan-area black women of similar age who had delayed childbearing until their 20s.[9]

Table 1. Probability that metropolitan-area young black men and women would have sexual intercourse, experience a pregnancy or begin childbearing before age 16 and age 19, by sample, mother's age at first birth and gender

Activity of children	Sample and mother's age at first birth					
	Baltimore—<18		NLSY†—14–17‡		NLSY†—≥20‡	
	Females	Males	Females	Males	Females	Males
Intercourse before age 16	0.52*	0.69	0.26**	0.66	0.18***	0.63
N	116	112	238	218	511	416
Intercourse before age 19	0.95	0.96	0.85**	0.96	0.72***	0.92
N	116	112	238	197	511	379
Pregnancy (or partner's pregnancy) before age 19	0.51*	0.31	0.46	u	0.31***	u
N	114	110	237	u	505	u
Live birth before age 19	0.36*	0.16	0.33	0.15	0.21***	0.09***
N	118	113	235	215	505	408

*Differences between males and females within Baltimore sample are significant at $p<0.05$.

**Differences between Baltimore respondents and the children of mothers aged 14–17 at first birth in the NLSY are significant at the $p<0.05$ level.

***Differences between children of mothers aged 14–17 and mothers aged 20 and older at first birth in the NLSY are significant at $p<0.05$.

†Mother's age at first birth is derived from the mother's current age and the oldest child's current age. This information was not available for 12 percent of cases, which are thus not included in this analysis.

‡The NLSY data are weighted. Only respondents living in standard metropolitan statistical areas are included in this analysis.

Note: u=unavailable.

The 17-year follow-up also presented a mixed set of findings on the children. The frequency of school failure, delinquency, emotional difficulties and other problem behavior was much greater among the Baltimore women's offspring than among the children of older mothers studied in the National Survey of Children, a nationally representative sample of children and their parents followed between 1976 and 1987. However, our study caught these children prior to adulthood, making it impossible to say how the children would negotiate this transition. For this reason, we undertook the 20-year follow-up.

Preliminary analysis of the 20-year follow-up data suggests that for many of the youths, the transition to adulthood was progressing well: The majority (63 percent) had completed high school or obtained a high school equivalency degree, and another 10 percent were likely to do so.[10] Still, a conspicuous minority had dropped out of school (23 percent) or had spent time in jails or other correctional institutions (17 percent), and a substantial proportion were experiencing symptoms of depression (32 percent). Compared with the children of older mothers studied in the National Survey of Children, the Baltimore youths were clearly not doing as well, even if the differences were not nearly as large as might have been predicted.

Sexual Behavior and Fertility

Table 1 provides information on the sexual behavior and fertility experiences of the second-generation blacks in the Baltimore study as of the 20-year follow-up, and contrasts their levels of sexual experience, pregnancy and childbearing with data on metropolitan-area blacks from the NLSY. (To make the two samples comparable, we divided the NLSY sample into the children of mothers who were 14–17 at their birth—the age-range of the original Baltimore sample—and the children of mothers whose first birth was at age 20 or above.) The information is presented by gender to reflect gender differences in fertility experience and perhaps differences in the accuracy of reporting by young men and women.

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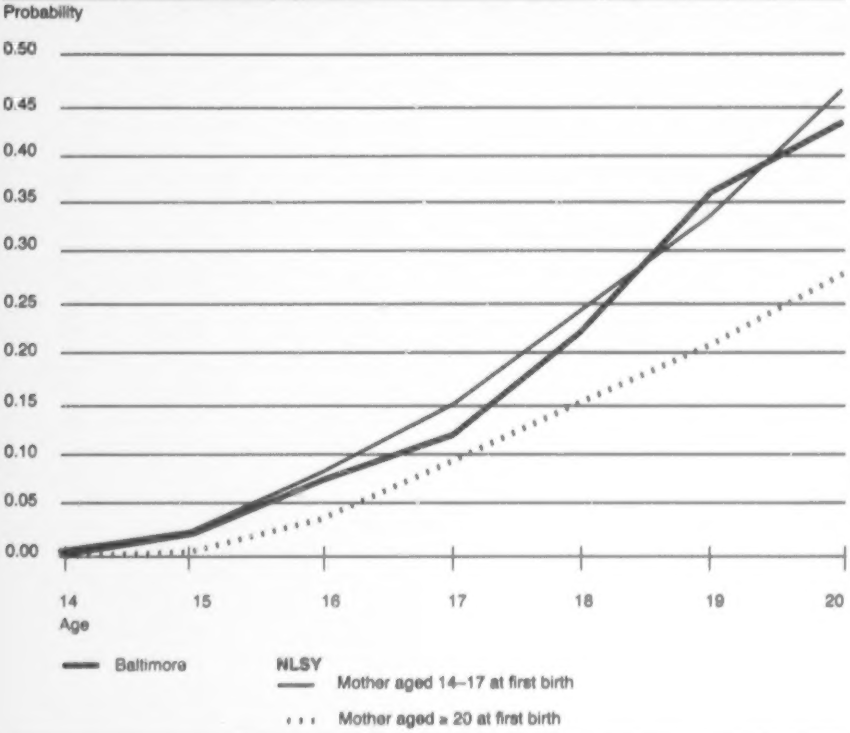
*A complete description of the research design can be found in F. F. Furstenberg, Jr., J. Brooks-Gunn and S. P. Morgan, 1987 (see: reference 8).

Figure 1. Probability that a metropolitan-area black adolescent female would have a live birth, by age, according to sample and her mother's age at first birth



To calculate the prevalence of sexual activity, pregnancy and childbearing, we constructed life-tables showing the risk that each would occur before a specific age. This approach allowed us to compute estimates for the members of the samples who had not yet reached that age. Thus, the data in Table 1 represent the probability that the young men and women would engage in sexual activity before age 16 or have intercourse, experience a pregnancy or bear a child before age 19. (We chose the latter age because, in keeping with the focus of public debate, we wanted to concentrate on events that occur to school-age teenagers.)

According to the data, the young women from Baltimore had a 52 percent probability of becoming sexually active by age 16, and the young men had a 69 percent likelihood of doing so. This gender gap disappears by age 19, however (0.95 vs. 0.96). In the NLSY, the gender differential remains, although it narrows with age.

Although the level of sexual experience among black male children of young mothers in the NLSY was similar to that of black Baltimore males, the black female children of teenage mothers in the NLSY were less likely to have had sex before age 16 than were the Baltimore females. This finding may represent either a real difference in sexual activity or a tendency of the females in the NLSY to underreport early sexual activity. Since there are no corresponding differences in pregnancy and childbearing, we suspect that the difference might be caused at least in part by underreporting.

In the NLSY, the daughters of mothers aged 20 and older at first birth were significantly less likely to have had sex before age 16 than were the daughters of the younger mothers (0.18 vs. 0.26). No difference was found for the males (0.63 vs. 0.66). We must exercise some caution in estimating the size of the gender gap in sexual activity because of questions about the reliability of the reports of sexual activity.

The seeming universality of sexual experience among older teenagers in the Baltimore sample actually conceals important variations in patterns of sexual behavior. When asked about their sexual activity in the past four weeks, 19 percent of the males and 21 percent of the females said they had not had intercourse, and 12 percent of both the males and the females had had sex only once or twice (not shown). Thus, sexual experience remained episodic and unpredictable for many youths even in their late teens and early 20s.

In the Baltimore study, females were much more likely to have become pregnant before age 19 (0.51) than males were to have impregnated a partner (0.31). However, the males either may not have known about a pregnancy or may have been reluctant to admit having caused one. More than one-quarter (28 percent) of the males answered affirmatively when asked, "Have you ever had a girlfriend who said you had gotten her pregnant but you didn't know for sure?" This suggests that much of the gender differential in the prevalence of pregnancy may be due to either the young men's ignorance of a pregnancy or their unwillingness to acknowledge responsibility for one.

In the NLSY, offspring of mothers who were 14–17 at their birth were more likely than children of mothers who were 20 or older to report having become pregnant during their teens (0.46 vs. 0.31). The pregnancy rate among females in the Baltimore sample did not vary greatly from that found among the daughters of mothers who were aged 14–17 in the NLSY, and was similar to 1981 pregnancy rates among black teenagers estimated for the NAS panel.[11] Pregnancy rates are notoriously unreliable, however, because of underreporting of abortion. Actual differences in pregnancy rates by the timing of mother's first birth may have been concealed if pregnancies that did not come to term were underreported.

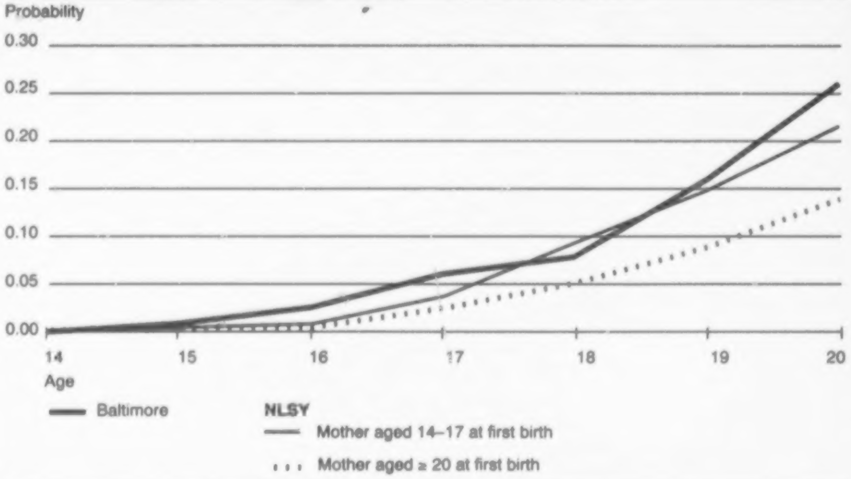
We have more confidence in the reports on childbearing. These data reveal three important findings. First, as is shown in Table 1, the variation by gender within the Baltimore sample is dramatic: While teenage women had a 36 percent chance of becoming a parent before age 19, the males had only a 16 percent likelihood of doing so. This may indicate that teenage women have children with men who are 19 or older; it also supports the possibility that teenage men are either unaware or hesitant to acknowledge that they have fathered children.

Second, the data from the Baltimore study closely correspond to those obtained from the children of black parents aged 14–17 in the NLSY. The probability that the female child of an adolescent mother in the NLSY would have a live birth before age 19 was 33 percent, compared with 36 percent for the young Baltimore women.

Finally, by looking within the NLSY sample, we see that early childbearing is a more likely occurrence for the children of teenage mothers than for the children of older mothers: The female children of mothers who were teenagers had a probability of school-age childbearing of 33 percent, compared with one of 21 percent for the daughters of mothers who were older.

This last finding does not necessarily demonstrate that the mother's age at first birth is directly implicated in the likelihood that her daughter will have a teenage birth. Children of teenage mothers are at greater risk of growing up in a single-parent family, of having less-educated and less securely employed parents and therefore of spending more time living in poverty. These economic and family differences may translate into multiple disadvantages that place adolescents at greater risk of early childbearing. However, the results in Figures 1 and 2 suggest that early childbearing at least is involved indirectly in increasing the chance that one's child will become a parent early in life. Figures 1 and 2 show that at each age from 14 to 20, sizable differences in the risk of childbearing occur between the offspring of mothers aged 14–17 at childbirth and those aged 20 and older. However, this is not the only point conveyed by the information shown in the figures. We also can see that the great majority of children of adolescent mothers do not become parents as young teenagers. That nearly two-thirds of the women in both studies delayed their first birth until age 19 or later shows that daughters do not necessarily, or even usually, "inherit" early childbearing from their mothers. Thus, second-generation early parents are a select subgroup of the offspring of teenage mothers.

Figure 2. Probability that a metropolitan-area black adolescent male would father a child, by age, according to sample and his mother's age at first birth



The Second Generation

We now turn our attention to a more intensive examination of the second generation of teenage mothers in the Baltimore sample. We will examine the similarities and differences between their accommodation to early parenthood and the way their mothers managed the adjustment some 20 years earlier. Remember, however, that we are focusing only on the subgroup of 42 teenage mothers instead of on the larger number of daughters who did not follow in their mothers' footsteps.

At the 20-year follow-up in 1987, most of the small group of second-generation mothers who had borne their first child before age 19 had children of preschool age—approximately as old as they themselves were at the time of the three-year follow-up in 1970. Thus, we can compare the adjustment to early parenthood for the 42 second-generation women who became teenage mothers with that of their mothers at roughly the same point in the two groups' lives. Obviously, the limited number of cases suggests that great caution is needed in interpreting the patterns described below.

Selected behavioral and attitudinal characteristics for those 42 pairs, as well as for the 72 pairs of original Baltimore mothers and their daughters who did not have a birth before the age of 19, are shown in Table 2 (page 58). The comparison between the two sets of pairs allows us to sort out the effects of generation vs. those of age at first birth. On the whole, the two sets of pairs exhibit similar mother-daughter differences, suggesting that these are due more to generation than to teenage childbearing.

However, the educational and economic characteristics break this pattern. The daughters who had become teenage mothers were much more likely than their mothers to have failed a grade (57 percent vs. 33 percent). The difference between the daughters who had delayed childbearing and their mothers (28 percent vs. 17 percent) was not statistically significant. Daughters who had become young mothers were not significantly different from their mothers in terms of whether they had graduated from high school (43 percent vs. 40 percent). However, these daughters had higher educational aspirations than their mothers had expressed; 56 percent and 37 percent, respectively, intended to seek some post–high school education, a difference that just approached statistical significance. Those who had not had a teenage birth, on the other hand, were dramatically more likely than their mothers to have finished high school (82 percent vs. 45 percent) and to want further education (88 percent vs. 37 percent). Although the daughters who had become adolescent mothers were about as likely as their mothers to be working (29 percent vs. 36 percent), the other set of daughters was much more likely to be employed than their mothers were at that point (67 percent vs. 44 percent). These data do not shed any light on the debate over whether low educational and occupational achievement are precursors to or consequences of adolescent childbearing, but clearly both generation and teenage parenthood are associated with the low educational achievement of the 42 young mothers, while generational effects tend to account for attitudinal and other behavioral characteristics.

The remainder of this article examines the experiences of the second-generation teenage mothers, to determine how they are faring compared with the way their mothers were managing at roughly the same point in their lives. The most obvious differences between the two generations of women are that 60 percent of the older group had married, compared with just 14 percent of their daughters, and that 45 percent were still married at that time, in contrast to only 12 percent of the younger generation.* These differences

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*At the time of the 1970 interview, the mothers' children were all approximately three years old, whereas at the time of the 1987 interview, the daughters' children ranged in age from newborn to five years. One might guess that this difference in the age of offspring might explain the difference in marriage and divorce rates. However, the daughters' marital status did not seem significantly associated with the age of their children.

Table 2. Among mothers who had a teenage birth and their daughters, percentage with selected characteristics or attitudes at comparable points in their lives, by whether daughter had a teenage birth, Baltimore study

Characteristic or attitude	Daughter with teenage birth		Daughter with no teenage birth	
	Mothers (N=42)	Daughters (N=42)	Mothers (N=72)	Daughters (N=72)
Education				
Failed a grade	33	57*	17	28
Graduated from high school	40	43	45	82*
Desires some post–high school education	37	56	37	88*
Economic status				
Employed	36	29	44	67*
Receives public assistance	31	60*	32	3*
Marriage and living arrangements				
Ever-married	60	14*	49	4*
Currently married	45	12*	36	3*
Wants to marry after age 25†	18	68*	24	67*
Believes it might be better not to marry†	14	14	17	16
Lives with no adult	10	0*	4	1
Receives child support‡	41	21	46	§
Fertility				
Disapproves of abortion	76	46*	55	40
Always uses birth control	34	24	37	42
Was happy on learning of first pregnancy	14	31	25	na
Was unhappy on learning of first pregnancy	33	26	41	na
Would be happy to become pregnant again	22	14	20	na
Would be unhappy to become pregnant again	57	67	62	na
Has had ≥2 births	33	31	35	na

*Difference between mothers and daughters is significant at $p<0.05$.

†Among the 17, 36, 37 and 69 respondents of the four respective groups who had never married.

‡Among the 22, 30 and 41 respondents of the four respective groups who were not living with the father of their child.

§Percentage is not given because of small numbers.

Notes: "Don't knows," no answers and missing responses were not included in percentages; na=not applicable.

reflect a fundamental shift in views about the desirability of early marriage, and perhaps in the acceptance of nonmarital childbearing.[12]

Two-thirds of the present generation of teenage mothers who had never been married thought that they would not marry before age 25. By contrast, less than one-fifth of the older generation of mothers who were single had subscribed to such a viewpoint. Obviously, these views reflect the broad secular trend in the preference for late marriage that has developed over the past 20 years.[13] The ideal of late marriage is echoed among the youths in the Baltimore sample who had not become parents: Those women were significantly more likely than their mothers to believe that they would not marry before age 25 (67 percent vs. 24 percent).

Many of the older generation who married early had expressed doubt about the viability of their unions, but were willing to risk the chances of a failed marriage to give their children "a proper name."[14] Others had acceded to the wishes of the child's father, who was frequently more eager than they to marry. Their daughters were more wary about the prospects of early marriage, probably in no small measure because of their parents' unhappy experience: Just one-third of their mothers' marriages to their fathers had survived. As one young mother explained, "It's really hard to find a man that is not going to mess around on you. . . . It's hard to find a guy that's ready, especially my age. . . . A lot of them just want to run the streets."

Nonetheless, almost all of the second-generation parents professed a belief in marriage and a desire to marry some day. When the young woman quoted above was asked if the father of her baby is the type of person she could imagine herself marrying, she replied, "In the long run. He's 24 and I figure when he is close to 30, he'll be ready." They were no more likely than their mothers had been (at least those who were still single at the time) to concur with the statement that "these days, it might be better for a girl not to marry": Only one in eight agreed that marriage might not be the best choice.

While commitment to marriage may not have disappeared, most of the younger generation of teenage mothers believed that a precipitous union would only make matters worse: It would interfere with their schooling, their chances of economic independence and, most of all, the steady supply of assistance they were receiving from their parents and kin. Significantly, none of the teenage mothers were living alone; almost all were still residing with their parents. In contrast, 10 percent of their mothers had been living as single adults when they were interviewed in 1970.

Many of the more involved fathers in the older generation married the mother of their child. As a result, the unmarried fathers in the older generation might have been self-selected for less interest in assuming paternal responsibilities. One might hypothesize, then, that because the unmarried fathers in the younger generation are a larger and more diverse pool, they would be more involved with their children than were the relatively few unmarried fathers of the previous generation. However, perhaps because the link between parenthood and marriage is now more tenuous, our data show that relationships between unmarried fathers and their children are weaker in the present generation. Unmarried fathers in the older generation were more likely to have been furnishing economic support and more likely to have continued contact with their children than were the males in the younger generation. The first-generation mothers who did not live with the father of their child were twice as likely to be receiving child support as were the daughters (41 percent vs. 21 percent); in addition, 55 percent of fathers in the younger generation had no contact with their children, compared with 38 percent of fathers in the older generation (not shown). These differences, although large, were not statistically significant because of small sample size.

If the economic position of unmarried fathers had declined from one generation to the next, today's fathers might lack (or might feel they lack) the resources required for active parenting. Thus, to explain unmarried fathers' decreased involvement with their children, we looked at the financial situation of fathers in the two cohorts (not shown). Although it is quite difficult to extract comparable information on the respective economic situations of the fathers, the limited data available indicate relatively modest differences between the two cohorts of still unmarried fathers. Three-quarters of the younger generation of unmarried fathers for whom we had information were employed, and the majority were high school graduates; their socioeconomic status was roughly comparable to that of the unmarried fathers in the older generation. Since economic differences fail to explain the declining involvement of unmarried fathers, a more complex web of changing parental attitudes, relationships with the mother of the child and societal views of an unmarried father's responsibilities may be at issue.

As we have noted already, second-generation teenage mothers are more likely than their mothers to desire a higher education. At the time of the interview, however, none had entered college, whereas one member of the older generation of mothers had entered college by the 1970 interview. We expect that some of the younger generation not currently in school will return eventually, but it seems unlikely that a high proportion will enter college.

There are two reasons for believing that the second-generation teenage mothers have a poor prognosis of greatly exceeding their own mothers' educational accomplishments in later life. First, they were almost twice as likely as their mothers to have failed one or more grades in school, and a prior analysis of the mothers' educational attainment in later life identified failing a grade in school as the single best predictor of not completing additional education beyond age 20.[15] Second, we would have expected the daughters to outperform their mothers in educational attainment, since marriage was an impediment to further schooling for the older generation, and more of them than of their daughters had married at young ages. Even though most of their daughters did not have this impediment to contend with, by a similar age, their mothers had achieved more educationally than they had. When marital status is taken into account, the difference in educational achievement is substantial. Over time, the daughters may actually attain less schooling than their mothers.

The fertility experiences of the younger generation of teenage mothers are not much more encouraging than their educational profiles. Approximately the same proportions of daughters as mothers had had two or more births (31 percent vs. 33 percent). The daughters, however, expressed less interest in having a large family: Fourteen percent wished to have three or more children, compared with 39 percent of the mothers (not shown).

According to the pregnancy histories, about the same proportion of each generation had become pregnant one or more additional times within the first several years after the birth of their first child, but more of the younger generation of women had obtained abortions. The pregnancy histories may be flawed by what is probably severe underreporting of abortion in both generations. However, the information we have is consistent with the greater availability of abortion in the mid-1980s than in the early 1970s. Also, fewer of the daughters disapproved of abortion than did their mothers at a comparable age (46 percent vs. 76 percent).

Even though the daughters had distinctly lower family-size ideals than their mothers, they appeared to be no more adept at using contraceptives regularly. Fewer were using the pill and, probably for that reason, fewer used birth control on a regular basis (although the difference was not statistically significant). The daughters' greater willingness to resort to abortion may restrict their ultimate fertility, although we suspect that many will adopt the same strategy as their mothers for limiting family size: Most of the older generation were sterilized in their late 20s, after they had had two or three children.

Whether today's teenage parents will curtail their childbearing in a similar fashion depends in part on whether their restrictive family-size goals govern their actions. On average, the daughters reported less conflict than had their mothers about becoming pregnant the first time—even though they were far more likely to be unmarried at a similar age. Although the differences were not statistically significant, 31 percent of the daughters and 14 percent of the mothers reported they were happy about their first pregnancy, and 26 percent and 33 percent, respectively, said they were unhappy. Nonetheless, the daughters were slightly more inclined than their mothers to report that they would be unhappy if they were to become pregnant again (67 percent vs. 57 percent). Correcting for generational differences in marital status partially explained this disparity, in that single mothers in both generations were more negative about additional childbearing than were married mothers. Still, we see no overall trend toward greater acceptance of additional childbearing within a short interval of the first birth. Like their mothers, perhaps even more so, second-generation teenage mothers seem committed to small families. If we take these fertility goals seriously, we might expect to see an even earlier pattern of voluntary sterilization among the younger cohort of teenage mothers, given their sporadic contraceptive use and greater reliance on abortion.

It is still too soon to get a good fix on the economic status of the younger generation of teenage mothers, but the early signs are not reassuring. Compared with their mothers at the same age, about the same percentage of the younger generation are currently employed (29 percent vs. 36 percent), and a much higher proportion are receiving public assistance (60 percent vs. 31 percent). The younger generation's greater reliance on welfare is attributable in part to the marriage patterns we described earlier. Nonetheless, even when our comparison is confined to single and formerly married women, reliance on welfare is higher in the younger generation (not shown).

Sixty percent of both mothers and daughters were neither working nor in school at a comparable stage in their lives. However, when we confine our comparison only to the single women, we can see a dramatic difference in the proportion not working or in school—39 percent of the mothers vs. 61 percent of the daughters. For this subgroup of daughters, the prospect of exiting from welfare rapidly is not very high. It seems reasonable to forecast that a significantly higher fraction of the younger generation of teenage mothers will remain on welfare for long periods than did their mothers (who, for the most part, avoided long periods of welfare dependency).

These findings raise the question of whether the mother's history of welfare experience is implicated in her daughter's chances of becoming a teenage mother, and hence her potential for early welfare dependence. To answer this question, we must return to an examination of all of the mothers and daughters. The route to welfare is having a child. Consequently, we will look at the effects of the mother's welfare history on whether her daughter had a child before age 19: We will examine not only whether the mother had ever received public assistance, but also the length and timing of her dependence.

It is important to recognize the limitations of this analysis. Establishing a link between welfare history and early childbearing from one generation to the next is not adequate proof that welfare dependence is transmitted within the family, through parental socialization or model-

Table 3. Logistic regression analysis of the effects of maternal welfare experience on the daughter's likelihood of having a live birth before age 19, by variables contained in regression model (N=112), Baltimore study

Variable	Model							
	1		2		3		4	
	Beta	Standard error	Beta	Standard error	Beta	Standard error	Beta	Standard error
Intercept	–0.916	0.374	–0.916	0.374	–0.916	0.374	–0.916	0.374
Any welfare receipt	0.357	0.443	–0.182	0.523	–0.217	0.550	–0.383	0.593
Recent welfare receipt	na	na	1.04	0.491	0.993	0.549	1.52	0.814
Long period of welfare receipt	na	na	na	na	0.115	0.550	0.606	0.766
Recent long period of welfare receipt	na	na	na	na	na	na	–0.972	1.09
Log likelihood	142.82	na	138.13	na	138.09	na	137.29	na

Notes: Information on welfare was incomplete for 11 cases, which were excluded from this analysis; na=not applicable.

ing. Welfare mothers are less educated, are far poorer and live in more impoverished neighborhoods than do women not relying on welfare for support. Their offspring may become teenage parents because of both extrafamilial and intrafamilial influences somewhat independent of their parents' values or parenting practices; similarly, they may be more susceptible to welfare because of their family's inability to supply material assistance. Thus, we provide an upper bound estimate of the potential extent of intergenerational influence, but cannot explain the mechanisms by which welfare reliance may be transmitted from one generation to the next.

To examine the types (if any) of welfare experience among the mothers that increased the chances of their daughters having children before age 19, we used a hierarchical structure to test our models. In each of the four logistic regressions estimating the models shown in Table 3, the dependent variable is whether the daughter had a live birth before age 19. The single independent variable in Model 1 is whether the mother ever received welfare during the first 19 years of her daughter's life (from birth through year 18). In Model 2, we add whether the mother had a recent period on welfare (defined as one that occurred when the woman's daughter was 13–18 years of age). Model 3 includes whether or not the mother had a long history (five years or more) of welfare reliance during the daughter's first 19 years. Finally, Model 4 adds whether the mother had a long and recent welfare history during her daughter's first 19 years.[*]

Comparing log likelihoods demonstrates that Model 2 fits significantly better at the $p<0.05$ level than Model 1, indicating that recent welfare receipt on the part of the mother increases her daughter's chances of becoming a teenage mother. Models 3 and 4, on the other hand, are not significantly better fitting models than the model that precedes them. Duration of the mother's welfare receipt did not seem to affect the daughter's risk of early childbearing. Although this finding must be confirmed by similar analysis of a larger data set, it suggests that the timing of maternal welfare receipt is a more potent predictor of teenage parenthood for the daughters than was duration of welfare.

The risks of teenage childbearing are quite high among the families currently on welfare, but it is important to note again that many teenagers in this select population managed to avoid early parenthood. Half of the offspring of current welfare mothers did not have a child before age 19. Some may emphasize the vulnerability of this population to early childbearing, but it is equally important to realize that close to half of young women from welfare families appeared to be taking a different life course from that of their parents.

Conclusion

This analysis of fertility experiences of the offspring of teenage mothers has uncovered some surprising findings. In order not to generalize inappropriately from our results, we must keep in mind the particular nature of the original sample that we have studied—it is made up almost exclusively of urban, black families who were poor or near-poor before their children's births. Our results do not pertain to whites or to nonurban blacks. Still, we have studied an important population that is relevant to current debates over the existence of a growing urban underclass.

We have found that the offspring of black teenage mothers are at greater risk of developing problems in late adolescence and early adulthood than are the children of mothers interviewed in a national study who did not give birth as teenagers. However, the differences between these two populations were not as large as might have been anticipated by those who believe that early parenthood powerfully determines the life course of the children of teenage parents. Although they were at a distinct disadvantage, most of the children of the teenage parents in our sample had completed high school and were either employed or currently in school, and only a small fraction were receiving public assistance. This is because close to two-thirds of the females had postponed childbearing beyond age 18, suggesting that early childbearing is neither inevitable—nor even the modal pattern—among the offspring of urban, black teenage mothers.

Nonetheless, an analysis of the NLSY data demonstrated that early childbearing is much more common among children of teenage mothers than among offspring of women who had children at a later age. Within the Baltimore sample, the children of women who had had recent periods on welfare were especially at risk. Just over half of the daughters in families receiving welfare during their adolescent years had had a child before age 19. Our findings leave unanswered the question of whether these young women were particularly susceptible to early childbearing because of family socialization, limited family resources or residence in neighborhoods where early childbearing was common.

Part of this article is devoted to an examination of the adjustment to teenage childbearing among our small subgroup of second-generation adolescent mothers compared with that of their mothers in 1970. An earlier analysis had suggested that many of the older generation of mothers would fare reasonably well over the long term.[16] Is the prognosis for the daughters equally favorable? The early indications are not encouraging. More of the daughters were unmarried, and most expected to remain single in the near future. Because of this propensity to remain single, a far greater proportion of the younger generation were receiving public assistance. In addition, indications that they would leave welfare were less encouraging. Although the daughters had higher educational goals, more had a history of having failed a grade—an ominous sign for future educational attainment. Moreover, a higher proportion of the younger generation of teenage mothers were neither employed nor in school, perhaps a further indication of poor future prospects.

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[*] In a subsequent analysis, we will attempt to predict which daughters become teenage mothers, by including a greater variety of variables in our models. Here, our goal is simply to examine the relative roles of the different types of welfare history in putting daughters at risk of early motherhood.

The younger generation desired smaller families, even though they had experienced the same number of second births at a comparable age. They were somewhat less adept at practicing contraception and were more likely to resort to abortion. At this point, it is difficult to forecast their eventual fertility, although it remains possible that they will have fewer children than their parents.

Nonetheless, our results indicate that today's teenage parents may be less likely to overcome the handicaps associated with early childbearing than were their parents. A greater fraction are at risk of long-term welfare dependence, and their offspring may, in turn, be raised in more disadvantageous family circumstances. We must wonder whether these findings portend the growth of an urban underclass.

In addressing this point, however, we need to recognize some countervailing trends. First, the great majority of offspring of teenage mothers are not repeating the pattern of their parents. Overall, out-of-wedlock teenage childbearing in the black population has not increased over the past two decades; indeed, it has dropped slightly since the early 1970s,[17] no doubt in part because of the legalization of abortion.

Second, the availability of abortion has changed the composition of the teenage-parent population. Once pregnancy occurs, fewer teenagers today are forced to become parents, making early parenthood (relatively speaking) a more voluntary act. Although abortion is undoubtedly underreported in our sample, we strongly suspect that more educationally competent teenagers opt out of parenthood. Compared with teenagers who became mothers before age 19, those who had aborted a pregnancy were much less likely to have previously repeated a grade in school and held higher educational aspirations. There is good reason, then, to suspect that access to abortion is filtering out the more ambitious and talented teenagers who might have become parents a generation ago.

If we are correct, this trend suggests caution in interpreting the results of generational comparisons as evidence of a self-perpetuating underclass. Differences between the generations may be at least partly due to exogenous trends in abortion. We also have noted that the decline in marriage after early childbearing is part of a more general distrust of the benefits of marriage that is not confined to black teenagers.

Ultimately, we should not let the political and scholarly debates over the existence and nature of the underclass blind us to the present position of second-generation teenage mothers. Whatever the reasons for their vulnerability—processes of selection or socialization or simply less access to resources—second-generation teenage mothers in the 1980s appear more vulnerable to long-term dependence and probably less equipped to maneuver their way out of life-long disadvantage than were their mothers in the late 1960s. For this reason alone, they should be targeted for extensive educational and social services. We do not need to invoke the more general specter of an expanding underclass to recognize that second-generation teenage mothers may require intensive intervention lest they remain trapped in poverty.

Although the picture for the second-generation teenage mothers is bleak, there is an encouraging side to our findings. Most of the teenage children of the original Baltimore mothers did not become teenage parents themselves. Of those teenagers without children, most had completed high school, and many went on to college. No doubt, despite great efforts, some will be unable to lift themselves out of poverty, because of the strong current of poverty and disadvantage; but it is equally possible that the toehold into the middle class that they are now establishing will grow firmer. An unfortunate side effect of the discussion of the underclass is that it focuses on the small group that is left behind, while the less visible majority manages to interrupt the cycle of poverty. By ignoring this phenomenon of upward mobility, we miss the important dynamics of transition out of poverty. Once this phenomenon is understood, policies designed to promote such dynamics might lead to even more children of poverty becoming adults in a less disadvantaged world.

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Risk Behaviors for HIV Infection in Clients Of Pennsylvania Family Planning Clinics

By G. Stephen Bowen, Sevgi O. Aral, Lawrence S. Magder, Deborah S. Reed, Cathy Dratman and Shari C. Wasser

Summary

Responses from a statewide survey of risk behaviors among clients of Planned Parenthood clinics in Pennsylvania indicate that a sizable proportion of these women are at intermediate or high risk for exposure to the human immunodeficiency virus (HIV). Overall, nearly five percent of the 15,499 women in the sample reported personal behavior, or a partner's behavior, that placed them at high risk, while an additional 20 percent were at intermediate risk. Among all women surveyed, 13 percent had had three or more partners in the past year, 12 percent had had a sexually transmitted disease, four percent had partners who were intravenous (IV) drug users, two percent were either current or past IV drug users, one percent had bisexual partners and less than one percent had partners who had hemophilia or who were infected with the AIDS virus.

Introduction

In 1983, family planning agencies in the United States were providing contraceptive and other medical services to nearly five million clients in 76 percent of all counties.[1] Data from the 1982 National Survey of Family Growth indicate that 18–26 percent of women aged 15–29 and 5–12 percent of those aged 30–44 receive contraceptive counseling and services from family planning clinics.[2] A higher proportion of black women than white women receive services at public family planning clinics, and for many women, these clinics are their only source of medical care.[3]

An estimated 1.0–1.5 million Americans are infected with HIV,[4] and the cumulative number of reported AIDS cases may reach 270,000 by 1991.[5] During 1988 and 1989, more than 10 percent of new AIDS diagnoses reported in the United States were among women; in several states, the proportion reached 15–20 percent in 1988.[6] Nationwide, this proportion has been steadily increasing since 1982, and it will undoubtedly continue to rise. Seroprevalence surveys of women who gave birth or who received services at prenatal, family planning or abortion clinics in urban areas of the United States have found that HIV infection rates among such clinics range from 0.0–4.5 percent.[7] In 1987, 0.2 percent of women who gave birth in Massachusetts were seropositive; in the larger metropolitan areas, the seropositivity rate among women giving birth was 0.8 percent.[8] In addition, a recent survey suggests that 1.6 percent of women giving birth in New York City are seropositive.[9]

Family planning clinics and other women's health care providers such as obstetric and prenatal care clinics, maternal and child health programs, nutrition programs, primary health care clinics of city, county and state health departments, and federal community and migrant health clinics all regularly provide services to women who may be at risk for HIV. For many women, these programs serve as access points to the health care system.

This article describes the results of self-administered questionnaires given to 16,698 women receiving family planning services in Pennsylvania's 39 Planned Parenthood clinics during the fall of 1987. The survey's objective was to quantify risk behaviors for HIV infection so that providers throughout the state would have the needed baseline data to develop educational materials and train staff for risk-reduction counseling. The survey also sought to document the proportion of women at risk for HIV infection and in need of other prevention interventions.

Methods

A self-administered, anonymous questionnaire with 17 questions about clients' and their partners' risk behavior, as well as condom use, was given to women while they waited to receive clinic services. The questionnaire required no more than 10 minutes to complete and contained no patient identifiers so respondents were assured of anonymity.

To check consistency of responses, we compared questionnaire responses of women in the Philadelphia clinics to data obtained through interviews with these same women.[10] The risk-behavior data were very similar, although the item-specific response rate by interview was slightly higher than that obtained by the self-administered questionnaires.

A clinic staff person explained the purpose of the questionnaire, urged patients to participate in the survey and answered any questions. A total of 16,698 women turned in a questionnaire; of these, 9,009 were age 20 years or older. In most facilities, more than 95 percent of women participated (although the participation rate was as low as 60 percent in one clinic). We believe that staff enthusiasm, a willingness to answer questions and an adequate explanation of the survey's purpose contributed to this high completion rate. In all, 93 percent of clients (15,499) in the 39 clinic sites answered all of the key risk-factor questions. A higher proportion—99 percent (16,553)—partially completed the risk-factor items and demographic sections

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of the questionnaire. The number of women answering each risk-behavior question ranged from 16,083 to 16,429.

If a woman's personal behavior or that of her partner placed her at risk for HIV infection, we classified that risk as high or intermediate based on a predetermined set of criteria. A woman was considered to be at high risk if she used intravenous (IV) drugs within the last five years, or if she had ever been the partner of an IV drug user, a bisexual man, a man with hemophilia or a man infected with HIV. Intermediate risk was attributed to women who had had a sexually transmitted disease (STD) diagnosed by a medical provider or had had three or more partners in the last year. The remaining women were considered to be at low risk.

We analyzed the data by age, race, education, marital status and age at first intercourse. Univariate and multivariate analyses of high-risk and intermediate-risk categories and of individual risk behaviors were carried out. We used logistic regression to assess the simultaneous effects of several variables on HIV risk behaviors.

Table 1. Percentage of family planning clinic clients who engaged in risk behaviors for HIV infection, by selected demographic variables, Pennsylvania, 1987

Variable	I V drug user	History of STD	≥3 partners in last year	Partner of			
				I V drug user	Bi-sexual man	Man with hemo-philia	Man with HIV infection
Total (N=16,083)*	**1.8**	**11.5**	**12.7**	**4.3**	**1.3**	**0.2**	**0.1**
Age-group							
<15 (N=167)	2.0	6.0	20.5	4.0	0.5	0.0	0.0
15–19 (N=6,621)	1.4	8.1	15.0	3.4	0.6	0.1	0.0
20–29 (N=8,607)	2.0	14.1	11.2	4.7	1.6	0.2	0.1
≥30 (N=1,158)	2.6	12.2	9.7	6.0	2.1	0.2	0.2
Race/ethnicity							
White (N=14,236)	1.8	10.2	12.7	4.3	1.2	0.1	0.1
Black (N=1,986)	1.1	21.5	12.4	3.4	1.3	0.3	0.1
Hispanic (N=275)	0.8	7.5	10.0	4.9	1.5	0.4	0.0
Other† (N=56)	2.7	14.9	16.5	6.5	2.8	2.7	0.5
Marital status							
Single (N=6,808)	1.8	15.0	12.6	4.7	1.8	0.2	0.1
Married (N=1,751)	2.4	8.1	2.5	3.1	1.1	0.3	0.1
Div., sep. or widowed (N=1,167)	2.9	15.6	14.8	6.7	1.9	0.1	0.1
Educational attainment							
<High school (N=875)	5.8	15.1	9.7	10.4	1.7	0.4	0.5
High school graduate (N=3,599)	2.4	12.7	9.6	6.1	1.2	0.2	0.1
≥1 semester college (N=5,252)	1.2	14.5	12.2	3.2	2.0	0.2	0.1

*16,083 is the minimum total of women responding to each risk item (the number of respondents for each item ranged from 16,083 to 16,429).

†Includes Native Americans, Asian Pacific Islanders and those who gave no race/ethnicity information.

Note: Data on marital status and educational attainment apply to women 20 and older, 717 of whom did not complete all of the risk behavior questions.

Results

Of the 16,553 clinic patients who supplied demographic information, 86 percent were white and 78 percent were aged 15–24. Information on marital status and education was compiled for women aged 20 and older. Of these, 70 percent had never married and 91 percent had completed at least a high school education.

The proportion of clinic clients who engaged in risky behaviors by demographic variables is presented in Table 1. Of all women completing the risk behavior questions, two percent were current or past IV drug users; 12 percent had a history of STDs; 13 percent had had three or more sexual partners in the past year; four percent had partners who were IV drug users; one percent had male partners who were bisexual; and fewer than one percent had partners who had hemophilia or were known to be infected with HIV. Individual clinics varied in the proportion of clients who were IV drug users or whose partners were at risk (not shown). In one clinic, nine percent of clients were IV drug users and 19 percent had ever had partners who were, while the corresponding proportions in a "low-risk" clinic were 0.3 percent and 0.9 percent, respectively. Furthermore, the proportion of clients who reported having had male bisexual partners ranged from zero to two percent among clinics.

Table 2 (page 64) presents the breakdown of clinic patients into the three risk categories. Overall, nearly five percent of the survey participants reported personal behaviors or partners' behaviors that would place them at high risk for HIV infection. The probability of being at high risk was greatest among women over 30 ($p=0.003$), white women ($p=0.03$), those who were separated, widowed or divorced ($p<0.001$) and those with no college education ($p<0.001$). Adolescents younger than 15 were at least as likely as those aged 15–19 to be at high risk for HIV infection.

Risk avoidance was minimal among women whose partners were at high risk for HIV infection (not shown): Only five percent of the women surveyed always used condoms with their regular partner, and just two percent always used condoms with all regular and casual partners.

The proportion of clinic clients who were at high risk ranged from a low of one percent to a high of 21 percent; six percent of clinics had a client population in which at least 10 percent were at high risk. Rural clinics tended to have a lower proportion of clients at high risk.

Almost 20 percent of our sample were at intermediate risk for HIV infection (clinic range of 12–28 percent), since they reported a history of an STD or three or more partners during the past year. The remaining 76 percent of women (clinic range of 64–84 percent) were at low risk.

For teenagers, age at first intercourse was highly associated with risk behavior. Compared with teenagers who first had intercourse at age 16 or older, those teenagers whose first experience occurred earlier were 2–3 times more likely to be at intermediate or high risk for HIV infection (i.e., to be an IV drug user, to have a partner at risk for HIV infection, to have a history of an STD or to have had three or more partners during the past year).

The relationship between high-risk behavior and demographic characteristics is further elucidated by a multivariate analysis of risk behaviors. Women younger than age 20 were excluded from the analysis because they have not had the same opportunities to complete higher education or to marry as have older women. We found that after controlling for age, marital status and education, there was no significant difference between blacks and whites with respect to high-risk behavior (OR=0.86).

The effect of age (≥30 vs. 20–29) on risk

Table 2. Percentage distribution of clients of family planning clinics, by HIV-risk category, according to sociodemographic variable

Variable	High	Intermediate	Low	Total
Total	**4.8**	**19.2**	**76.0**	**100.0**
Age				
<15	4.8	22.2	73.0	100.0
15–19	3.9	19.2	76.9	100.0
20–24	4.5	19.9	75.6	100.0
25–29	6.9	18.6	74.4	100.0
30–34	7.2	16.7	76.1	100.0
≥35	5.1	16.3	78.6	100.0
Race/ethnicity				
White	4.9	18.2	76.8	100.0
Black	3.5	27.7	68.9	100.0
Hispanic	3.3	12.7	84.0	100.0
Other*	7.7	21.3	71.0	100.0
Marital status				
Single	5.0	21.4	73.6	100.0
Married	3.8	8.2	88.0	100.0
Divorced, separated or widowed	9.3	22.4	67.8	100.0
Educational attainment				
< High school	5.4	19.0	75.6	100.0
High school graduate	5.3	17.2	77.4	100.0
Completed some college	4.0	20.8	75.1	100.0

*Includes Native Americans, Asian Pacific Islanders, and those who gave no race/ethnicity information.

behavior varied significantly only among women with some college education: Among college-educated women, older women were 1.6 times as likely as younger women to be in a high-risk category. Similarly, the effect of education on risk category varied by age-group. Among 20–29-year-olds, those who had completed high school were only 0.6 times as likely to be in the high-risk category (confidence interval, 0.4–0.8) as women who had not, and women who had had some college education were 0.4 times as likely to be at high risk (confidence interval, 0.2–0.7) compared with those who had not completed high school. There were no significant differences in risk by education among women aged 30 and older. When the other factors were controlled for, married women were significantly less likely than never-married women to be at high risk for HIV infection (OR=0.7), and those who were separated, widowed or divorced were significantly more likely than single women to be at high risk (OR=1.62).

Discussion

The survey documents that a sizable proportion of family planning clients (including younger teenagers) or their partners engage in behavior that places them at moderate or high risk for HIV infection. This proportion varied greatly from clinic to clinic. Condom use was low among all clients including those with multiple partners and those whose partners were themselves at increased risk of infection. Early age at first intercourse was associated with increased risky behavior.

The data generated in this survey are the first to summarize HIV risk behavior in a statewide population of family planning clinic patients. Although the clients of the Pennsylvania Planned Parenthood clinics may not be representative of all family planning clients in the state or in the nation, we consider the proportion of women at moderately high risk and high risk for HIV infection to be alarming.

Family planning clinics may be the only providers of health care to many of their clients. All clients should receive at least basic education on the modes of HIV transmission and the types of high-risk behavior associated with it. Risk behavior can be assessed in the clinic setting either by personal interview or by a self-administered questionnaire, using a standard set of questions related to sexual and intravenous transmission of HIV. One-on-one risk reduction counseling should be offered to clients who either themselves engage in risky behavior or who have partners who do. We realize, however, that the interview or questionnaire will not identify a proportion of already infected women because some women may simply not know about their partners' risky behavior or be unwilling to discuss their own behavior or their partners'.

Careful assessment of the risk behavior and STD history of the woman's partner or partners is very important, since many of the clients in our survey who had had an STD also had just one partner. The Centers for Disease Control has obtained data showing that from 11 to 39 percent of the female partners of men with HIV infection may be infected themselves.[11] Thus, careful counseling must also involve discussion of the risk behaviors of partners.

Before beginning AIDS prevention programs, family planning clinics should make agreements with other agencies to refer clients engaging in high-risk behavior for needed services. Clients in the highest risk category should either be referred for HIV-antibody testing or counseling or, alternatively, such services should be provided on-site. Women with an STD should be treated at the clinic or referred for treatment elsewhere if such services are not available. In addition, those women in the intermediate-risk category should also be referred for, or provided with, HIV counseling and testing. Clients who are IV drug users should be referred for treatment and helped to achieve admission to drug abuse treatment programs.

Depending on their location, the aggregate risk behavior of their clients and staff availability, family planning clinics may elect to implement other elements of an AIDS prevention program including blinded seroprevalence surveys and on-site HIV-antibody testing and counseling for members of the community who are not seeking family planning. They may also choose to have women with HIV infection referred to them for contraceptive services or counseling.

The HIV epidemic is a public health problem of great urgency. Family planning and other service providers who regularly see women at high risk can play an important role in reducing the impact of the epidemic by routinely providing prevention-oriented services. If they fail to do so, important opportunities to prevent or change risky behavior and reduce the risk of HIV infection will be lost.

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Contraceptive Failure of the Ovulation Method of Periodic Abstinence

By James Trussell and Laurence Grummer-Strawn

Summary

Previously published estimates of probabilities of method and user failure for all contraceptive methods suffer from a serious methodological error and are biased downward, with the extent of bias unknown. Data from a World Health Organization clinical trial of the ovulation method of periodic abstinence were used to provide the first correctly calculated measures of method and user efficacy and to determine the characteristics that distinguish women who consciously take risks from those who do not. Probabilities of pregnancy during the first year are 3.1 percent during perfect use (method failure) and 86.4 percent during imperfect use (user failure). Thus, if used perfectly, the ovulation method is very effective. However, it is extremely unforgiving of imperfect use. Because perfect compliance is difficult for many couples who desire intercourse when it is forbidden by ovulation method rules, and because the risk of pregnancy during imperfect use is so great, the ovulation method cannot be considered an ideal contraceptive method for the typical couple, who are likely to be less compliant than couples who volunteer for a clinical trial. The probability of an accidental pregnancy is greatest when any of the three most serious rules—no intercourse during mucus days, within three days after the day of peak fecundity or during times of stress—are broken. Those who have a poor attitude toward the rules are more likely to take risks, including serious risks. Those who get away with taking a risk (i.e., do not get pregnant) are very likely to take risks again. Because breaking the most serious rules entails a 28 percent risk of pregnancy per cycle, those likely to take risks should be counseled about the probable consequences.

Introduction

To make truly informed choices about contraception, couples need to know not only the efficacy of methods as they are actually used and misused by real couples (the only firm measure of contraceptive failure now available), but also the efficacy of methods when used correctly and consistently and when used imperfectly. The difference between failure rates during imperfect and perfect use provides couples with a measure of how forgiving of imperfect use a particular method is likely to be. The proportion of months (or menstrual cycles) characterized by perfect use (or the proportion of users who always use a method perfectly) provides couples with a measure of how difficult a method is to use correctly and consistently.

A previous comprehensive review of the literature on contraceptive failure identified several areas in which research is critically needed.[1] Foremost among these is proper measurement of the risk of method and user failure for all contraceptives. This article takes a first step toward that goal by providing estimates of method and user efficacy for the ovulation method of periodic abstinence. In addition, it provides the first information on variables associated with risk-taking behavior among users of this method.

The ovulation method is based on the discovery that changes in the characteristics of cervical mucus closely mirror hormonal changes during the menstrual cycle. Before 1975, very little information was available on a woman's ability to detect and interpret changes in her cervical mucus. Thus, the World Health Organization (WHO) conducted a clinical trial in centers in five countries (New Zealand, India, Ireland, the Philippines and El Salvador) to determine the proportion of women able to detect these changes, the factors affecting this ability and the efficacy of this approach to fertility limitation.

The results of that investigation, published in a series of five articles, have significantly enhanced our understanding of these questions.[2] The first striking finding was that 94 percent of the surveyed women (who were drawn from a wide variety of social, economic and cultural backgrounds) were able to detect the change in cervical mucus that signals the onset of the fecund period. After the first teaching cycle, 91 percent of the participants were rated as having a good or excellent understanding of the method.[3] After successful completion of a three-cycle teaching phase, 725 women entered a 13-cycle efficacy phase and collectively contributed 7,514 cycles of observation. The 13-cycle life-table pregnancy rate was 19.6 percent.

Unfortunately, the investigators published method efficacy rates computed by the standard procedure, which, we contend, is flawed. These calculations showed Pearl indices[*] of 2.8 and 18.9 for method failure and user failure, respectively, with one additional pregnancy (an index of 0.5) that was not unambiguously attributable to either method or user error.[4] As part of their analysis, the investigators examined

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[*] The Pearl index is obtained by dividing unintentional pregnancies by the number of woman-years of exposure to the risk of unintended pregnancy. It is usually then multiplied by 100. The defects of this index as a measure of contraceptive failure are discussed at length elsewhere (see: reference 1). The basic problem is that failure rates decline with duration of use, either because those prone to fail do so early, leaving a group increasingly unlikely to become accidentally pregnant, or because women (or couples) become better users with more experience. Consequently, Pearl indices from different studies are not comparable when average durations of exposure vary across studies.

psychosexual aspects of the ovulation method, including satisfaction of women and their partners and the prevalence of rule breaking.[5] The only characteristic of women examined in these analyses was their country of residence. Thus, this rich data set can be analyzed further to yield information that is both entirely new and clinically useful to counselors and couples considering the ovulation method. Specifically, characteristics that distinguish those who consciously break the rules from those who do not can be identified.

The major problem in drawing inferences from the experience of users of a contraceptive method occurs because women (or couples) select their own method, with their choice governed by a variety of factors such as cost, convenience and safety.[6] When data are drawn from a nationally representative sample of women, as is the case for the National Survey of Family Growth, results concerning contraceptive failure pertain to the population of women who choose to use each method. Self-selection of the method creates uncertainty, however, about what the experience of women would be if they were randomly assigned to a method. Our suspicion is that women who choose to use spermicides, for example, are inherently less successful users of any contraceptive than are women who choose to use the pill. Therefore, observed spermicide failure rates probably underestimate efficacy that would be achieved if users were chosen at random.

Efficacy data from clinical trials are yet another step removed from the population for which one would wish to make inferences, because the sample of users of a method in a trial is not even representative of the larger population of women who choose to use that method. Nevertheless, most efficacy information is drawn from clinical trials, simply because the data are rich and relatively plentiful.

We will not directly address the intractable issue of sample selection in this article. Our own results necessarily will pertain only to those women who satisfied the criteria for selection into the WHO trial—regularly ovulating women of proven fecundity who had not previously used the ovulation method and who were willing volunteers. However, we reason that the effect of selection on efficacy operates predominantly through consistency and correctness of use and consequently that selection does not significantly affect measures of inherent method efficacy (when computed correctly). Therefore, our estimate of the probability of method failure during perfect use should generalize to the population of potential users. Our estimate of the overall probability of failure during imperfect use depends on the particular combination of ways in which women in the trial broke the ovulation method rules, but our estimates for specific types of rule breaking should generalize beyond the sample.

Measuring User and Method Failure

Many investigators have recognized the importance of distinguishing between contraceptive failure attributable to user error and failure attributable to the inadequacy of the method itself. By convention, all pregnancies that occur during a month (or menstrual cycle) in which a method either is not used at every act of intercourse or is used improperly are labeled user failures. Only pregnancies that occur during a month (or cycle) during which a method is used perfectly are classified as method failures; perfect use does not imply that the method did not fail, only that the method was used consistently and correctly according to a well-specified set of rules. We have no objection to this convention (indeed, it is necessary), but it must be understood that not all pregnancies classified as user failures will in fact be user failures. For example, if in one month (or cycle) a method is not used or is used incorrectly during two acts of intercourse but is used correctly during eight other acts, a resulting pregnancy cannot unambiguously be attributed to user error instead of method failure.

The standard procedure is to compute separate method and user failure rates (pregnancies divided by exposure). In this procedure, all exposure from perfect and imperfect use is included in the denominator of both method and user failure rates. According to this convention, method and user failures are treated as two of many possible causes of method discontinuation. The sum of all cause-specific discontinuation rates is the overall or total discontinuation rate, and the sum of method and user failure rates is the overall or total failure rate. The common misinterpretation is that the resulting method rate yields information about the inherent efficacy of the method. Inherent method efficacy can be measured only when the numerator (method failures) is assessed in relation to the proper risk set (exposure only when the method is used perfectly). Method failure rates computed by the standard procedure confound inherent method efficacy with the proportion of exposure that is characterized by perfect use.

The following example illustrates how misleading the conventional interpretation can be. Suppose that we decide to evaluate an innovative contraceptive regime that is claimed not only to prevent pregnancy but also to enhance health. It requires a woman to stand on her head and drink orange juice during each act of intercourse. We conduct a clinical trial, which yields the amazing result that the method failure rate is zero percent, although common sense would dictate that the method is absolutely worthless (except insofar as perfect use would drastically reduce coital frequency). However, unbeknownst to us because we followed standard procedure and did not inquire, the sole reason for this zero percent failure rate is that no woman ever achieved perfect use in any cycle. By convention, no pregnancies can be classified as method failures if all exposure is characterized by imperfect use. Such reasoning leads to the conclusion that it makes no sense to treat method and user failures as causes of discontinuation. To be treated as a cause, an event must be a possible outcome for those in the risk set.* In an IUD trial, expulsion, removal for pain or bleeding and accidental pregnancy are proper competing risks; in contrast, user vs. method failures make no more sense as competing risks than do black vs. white pregnancies or teenage vs. adult pregnancies, because each of these alternative events is conditional on a separate risk set.

Conventionally computed method failure rates have definitely generated controversy. For example, the lowest Pearl index for periodic abstinence in the literature was obtained in a study of 282 women in Tonga.[7] The investigators discarded 50 pregnancies judged to have resulted from improper use and then calculated an index of 1.4 failures per 100 woman-years of exposure to risk. This study sparked a lively debate. John Marshall[8] and Roger Rochat[9] argued that it would be misleading to exclude the 50 pregnancies attributed to user error, so they added them to the numerator, thereby obtaining a Pearl index of 25.4. Henry Mosley stressed that the index of 1.4 was a theoretical measure of failure, while the index of 25.4 was a measure of failure during actual use.[10] No one pointed out the real error in the calculation yielding the index of 1.4.

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*For example, death rates by cause add to the overall death rate, because all persons are assumed to be at risk of dying from any cause. Clearly, one might argue that all persons are not exposed to every cause of death, even when analysis is age-specific and gender-specific. For example, a woman is not at risk of maternal mortality if she is sterile (or not having intercourse). However, such examples illustrate problems with the cause-of-death methodology rather than provide support for the standard procedure of computing method failure rates.

This error is quite widespread; method (or theoretical) failure rates have almost always been calculated incorrectly, because investigators remove only the pregnancies attributable to improper use from the analysis, although they retain all exposure. For example, in our review of 13 clinical trials of periodic abstinence, "method only" calculations (all incorrect) were found in 10, including the WHO analysis of ovulation method efficacy.[11]

The analytical error is the failure to realize that, by convention, method failures can occur only when the method is being used perfectly. Logically, as discussed above, method failures can occur during both imperfect and perfect use. During perfect use, however, the only failures that can occur are method failures, and method failure rates can be measured only when the method is used perfectly. The difference between the failure rate during imperfect use and the failure rate during perfect use provides a measure of the contribution of imperfect use to the likelihood of failure. Because the experimental design of most studies (the WHO study being an important exception) probes for imperfect use only when there is a pregnancy, method failure rates cannot be computed even if the investigators recognize the error in the standard procedure. As a consequence of this computational error, failure rates that are reported as method failure rates in the literature are too low, with the extent of the downward bias unknowable. For the same reason, user failure rates reported in the literature are also too low. Whether conventionally computed method failure rates are more or less severely biased than user failure rates depends on the proportion of total exposure characterized by perfect use.

Only three studies have calculated method failure rates correctly.[12] Nevertheless, none of these investigators identified their rates as "method" failure rates, and none of their publications informed subsequent work on method vs. user failure; furthermore, all estimates of failure were based on Pearl indices rather than on life tables, which control for duration of use. In principle, one could calculate method failure in two ways. First, one could split the sample into those who never used the method imperfectly and those who did so at least once. The resulting rates would pertain to perfect and imperfect users. This approach was taken by Eleanor Mears and N. W. Please and by A. P. K. John in analyses of the failure of spermicides and condoms, respectively.[13] Alternatively, the exposure (and failures) during periods of perfect use by the imperfect users could be combined with the exposure (and failures) of the perfect users to create measures of failure during perfect and imperfect use. Hilliard Dubrow and Katherine Kuder constructed rates in this manner in an analysis of failure of spermicides and the diaphragm.[14] Method failure rates yielded by the two approaches should be similar, provided that cycles of perfect use contributed by imperfect users are characterized by levels of coital frequency and underlying fecundity similar to those of perfect users. User failure rates will be higher if the second approach is used, because the exposure pertains solely to imperfect use.

Table 1. Summary of the ovulation method of fertility regulation

Approximate cycle day	Phase	How identified	Intercourse allowed?
1–5	Menstruation	Bleeding	No
6–9	Dry days	Absence of cervical mucus	On alternate nights only
10	Fecund period begins	Onset of sticky mucus secretion	No
16	Peak fecund day	Last day on which slippery mucus (resembling raw egg white) is observed	No
19	Fecund period ends	Evening of the third day after the peak day	No
20–29	Safe period	From evening of fourth day after peak day until onset of bleeding	Yes

Note: The cycle begins on the first day of menstruation. Menses is considered unsafe for intercourse because it is impossible to identify cervical mucus in the presence of bleeding and women with short cycles may enter the fecund period during the last days of bleeding. In the early (prefecund) dry days, cervical mucus is absent, but intercourse is allowed only on alternate nights (to minimize confusion between semen and cervical mucus). The fecund period begins on the first day on which cervical mucus is observed. When cervical mucus first appears, it is "sticky" and actually signals an infecund period for the woman. But, because sperm can survive for several days, intercourse is forbidden from the onset of sticky mucus. When the cervical mucus changes consistency by becoming "slippery" and resembling raw egg white, the woman has entered the most fertile phase of her cycle. The day of peak fecundity is identified retrospectively as the last day on which slippery mucus is observed; it usually, but not always, coincides with the day of maximum slippery mucus. The peak day marks the last day of the follicular (preovulatory) phase of the cycle; the luteal (postovulatory) phase begins on the following day. Intercourse is not allowed from the first day of sticky mucus until the evening of the fourth day past the peak day. The remainder of the cycle is considered safe. However, because stress can affect the quality of mucus, intercourse is forbidden during periods of stress. In the typical cycle of 29 days, intercourse would be allowed on about 12 nights (see: WHO, 1983, op. cit. [reference 2]). Checking cervical mucus involves several steps: First, the woman ascertains whether she feels a sensation of wetness or dryness. After obtaining mucus directly from the vaginal opening using a finger or toilet paper, she focuses primarily on its quality (lubrication, elasticity, wetness and tackiness) and secondarily on its color and quantity (see: D. Guren and N. Gillette, *The Ovulation Method: Cycles of Fertility*, Ovulation Method Teachers Association, 1984, Portland, Oreg.).

Because previous investigators have not probed for rule breaking at times when an accidental pregnancy did not take place, our understanding of the covariates of user and method failure is quite limited. Existing analyses are of dubious value, because their examinations of the covariates of "method" failure have measured method failure according to the standard procedure. For example, a reanalysis of worldwide data on the contraceptive sponge claims that there is no difference in method failure rates between parous and nulliparous women.[15] In contrast, analysis of the U.S. data reveals overall first-year failure probabilities of 28.3 percent among parous women and 13.9 percent among nulliparous women; no difference by parity was found for diaphragm users.[16]

Data

WHO invited five centers with experience in teaching the ovulation method to participate in a clinical trial. The centers were located in Auckland (New Zealand), Bangalore (India), Dublin (Ireland), Manila (the Philippines) and San Miguel (El Salvador). To participate in the trial, women had to be younger than 39, to have menstrual cycles of 23–35 days, to have had at least one live birth (or term stillbirth) within the preceding five years in the present union and to be cohabiting. Women were not eligible if they were lactating, if they had used hormonal contraception during any of the three cycles prior to admission into the study or if they had used the ovulation method previously. Participants had to agree to keep the necessary records and not to use any other method of contraception during the efficacy phase of the study.

Of 869 women admitted to a teaching phase of 3–6 cycles, 765 (88 percent) successfully completed it, and 725 entered the efficacy phase. (The remaining 40 withdrew for a variety of reasons; for example, because they wanted to get pregnant, were dissatisfied with the method or moved away.) The ovulation method rules, summarized in Table 1, forbid intercourse dur-

Table 2. Percentage of women using the ovulation method and percentage of cycles of use, by various demographic and method-related characteristics

Characteristic	%
WOMEN (N=725)	
Residence	
Auckland, New Zealand	14.1
Bangalore, India	26.3
Dublin, Ireland	26.9
Manila, Philippines	15.9
San Miguel, El Salvador	16.8
Age at admission (mean=29.8)	
<28	31.8
28–34	48.3
35–38	19.9
Perfect user (always obeys rules)	
Yes	54.1
No	45.9
Education	
Illiterate	12.4
<6 years	16.7
6–12 years	49.1
>12 years	21.8
Education of partner	
Illiterate	8.0
<6 years	17.7
6–12 years	39.4
>12 years	34.9
Occupation	
Housewife	83.2
Other	16.8
Occupation of partner	
Prof., tech., admin., clerical	32.7
Sales or service	12.6
Farming or skilled labor	45.1
Unskilled, student or unemployed	9.7
Number of previous pregnancies	
1–2	31.3
3–4	41.4
≥5	27.3
Attitude of partner*	
Fully cooperative	31.9
Attitude of partner (continued)	
Other	68.1
Partner completes charting*	
Always	8.6
Occasionally	25.1
Never	66.3
Couple took risk†	
Sometimes	38.0
Never	62.0
Couple took serious risk‡	
Sometimes	25.1
Never	74.9
CYCLES (N=7,484)	
Coital frequency per cycle (mean=4.88§)	
1–2	8.5
3–4	14.4
5–6	12.9
≥7	13.9
Unknown	50.2
Couple wants more children**	49.3
Woman prefers higher coital frequency	15.5
Partner prefers higher coital frequency	32.4
Attitude toward rules is excellent	30.2
Woman's satisfaction with method is excellent	21.7
Partner's satisfaction with method is excellent	21.7
Perfect use (obeys rules during cycle)	89.3
Couple took risk†	
In cycle	8.7
In previous cycle††	6.8
Two cycles previous‡‡	6.2
In both prior cycles§§	2.6
Couple took serious risk‡	
In cycle	4.1
In previous cycle*†	2.7
Two cycles previous*‡	2.3
In both prior cycles*§	0.7

*At graduation from teaching phase.

†Risk-taking defined as conscious breaking of any ovulation method rule. Rules are listed in Table 3.

‡Serious risk-taking defined as conscious breaking of the three most serious ovulation method rules forbidding intercourse during mucus/wet days, within three days after peak and during periods of stress.

§Mean for all cycles in which coital frequency is known.

**Not defined for women, because some women give different answers across cycles.

††When denominator is confined to those with two or more cycles, percent=7.6.

‡‡When denominator is confined to those with three or more cycles, percent=7.6.

§§When denominator is confined to those with three or more cycles, percent=3.2.

*†When denominator is confined to those with two or more cycles, percent=2.9.

*‡When denominator is confined to those with three or more cycles, percent=2.8.

*§When denominator is confined to those with three or more cycles, percent=0.9.

ing menses, on alternate "dry" days before the start of the fecund period (to minimize confusion between semen and cervical mucus), during the fecund period itself and during periods of stress. The fecund period begins with the onset of mucus secretion, peaks on the last day on which "fecund" mucus (resembling raw egg white) is recognized and ends on the evening of the third day past the peak day. Intercourse can be resumed on the fourth night past the peak day. Overall, intercourse is forbidden on roughly half the days in each cycle.

Separate data collection forms were used for each menstrual cycle, with each subject recording fecund days, days of bleeding and days of intercourse. Subjects were asked to record all acts of intercourse, but they were required to record, at a minimum, the last act before the onset of the fecund period, all acts during the fecund period, the first act after the end of the fecund period and whether all acts during the cycle were reported. From the form and a monthly meeting during which a teacher carefully questioned each subject, the teacher transcribed cycle details and judged compliance, comprehension and attitude. A total of 7,514 cycles were recorded for the 725 women. Copies of all forms were checked for consistency and completeness at WHO headquarters in Geneva, where an analysis file in machine-readable format was created.

One might object to our using the data from only the efficacy phase on the grounds that efficacy will be overstated because those most prone to fail would be eliminated in the teaching phase. We would agree with this criticism if we were interested in the overall proportion who fail during the first year of use. However, we reason that this selection process would operate primarily by weeding out imperfect users. Because the purpose of our analysis is to control for perfect vs. imperfect use (as well as for frequency of intercourse and age), we would not expect selection to be a factor. Moreover, the results published by WHO do not show any difference in the overall failure rates for the two phases.[17] There were 45 pregnancies in 2,701 cycles in the teaching phase (probability of failure = 0.0166 ± 0.0048) and 130 pregnancies in 7,514 cycles in the efficacy phase (probability of failure = 0.0173 ± 0.0029). Hence, the anticipated selection effect is not manifest in these data. Nevertheless, the primary reason that we have not included data from the teaching phase is practical rather than empirical or theoretical—they were not available to us.

In our analyses, we discarded 30 cycles during which, according to the women's reports, no intercourse had occurred; we retained 156 cycles about which there was insufficient information to determine whether intercourse had occurred. One might object that those who do not have intercourse in a cycle are nevertheless perfect users of the ovulation method. However, women simply are not exposed to the risk of contraceptive failure unless they have intercourse, so cycles characterized by no exposure to the risk of pregnancy should be removed.[18] Moreover, all qualitative results would be identical regardless of the inclusion or exclusion of these cases, and the quantitative impact of including the 30 cycles or excluding the 156 cycles is trivial. In all, 7,484 cycles were included in the analyses. We imputed perfect vs. imperfect use in a small number of cases for which data were missing, and we imputed coital frequency in a small number of cycles for which it was possible to do so.* The few cases for which data were missing on other variables were combined with the reference category for that variable. Consequently, effects estimates for these variables will be slightly attenuated.

Correlates of Failure

Our objective in the first of our analyses is to examine the characteristics of users of the ovulation method who experience a contraceptive failure. Our hypothesis is that three characteristics—perfect vs. imperfect use of the method, coital frequency and the underlying fecundity of the couple—are the dominant factors affecting contraceptive failure because they are the proximate biological determinants.[19] To study these characteristics, we use multivariate life tables or hazard models.†

The primary characteristic of interest is dichotomous: being a perfect or an imperfect user. We create two sets of models, each operationalizing this concept in a different way. The most straightforward is to classify as perfect users only those couples who always use the ovulation method perfectly. In the other procedure, couples are categorized as either perfect or imperfect users in each cycle; hence the cycle, not the couple, is characterized by either perfect or imperfect use. In the latter procedure, perfect use is a time-varying covariate. For example, a couple with perfect use in cycles 1 and 3 and imperfect use in cycles 2 and 4 would contribute cycles at durations 1 and 3 in the perfect-use life table and at durations 2 and 4 in the imperfect-use life table.

The second most important covariate is frequency of intercourse. Increased coital frequency raises the risk of contraceptive failure because exposure to the risk of failure is greater. Not only is there increased opportunity for imperfect use (at least with coitus-dependent methods), but also the risk of method failure rises with the number of occasions on which the method could fail. If effects of coital frequency are not controlled in studies of coitus-dependent methods (particularly periodic abstinence), method failure rates are likely to be low merely because low coital frequency is a good way to achieve perfect use. Imperfect users of the ovulation method are likely to have higher coital frequency on average because they have intercourse during the (roughly) half of the cycle when the ovulation method rules do not allow it as well as during the period when it is allowed. One of our goals is to separate the effects of imperfect use and coital frequency on method failure. Since coital frequency is not the same in each cycle, it is entered into the analyses as a time-varying covariate. However, complete information on all acts of coitus was provided for only half the cycles. Thus, when we categorized this variable, we were forced to include a category for unknown frequency.

A third important covariate is the underlying fecundity of the couple. Of course, fecundity is not observable. Fortunately, only women of proven fecundity were admitted to the WHO trial, so that the sample is, by design, relatively homogeneous on this dimension. We employ the age of the woman as a proxy for fecundity, because it will reflect the declining biological capacity to conceive as women age.[20]

We would expect that a model with these three covariates would adequately fit the data. However, a rich variety of other covariates, including socioeconomic characteristics and attitudinal measures, is available. We explore models with these additional characteristics to test our hypothesis that their importance in previous research reflects only the lack of data on the relevant biological proximate determinants. For example, the lower observed contraceptive failure rates among women who seek to prevent further pregnancies rather than to delay their next wanted pregnancy may simply reflect their greater consistency of use of a method and lower coital frequency.

Definitions of variables and their sample frequencies are displayed in Table 2. We provide frequencies for the sample of women when the information is woman-specific and for the sample of cycles when the information is cycle-specific. Age, coital frequency and number of previous pregnancies were coded as continuous variables by WHO (means for these variables are shown); for purposes of analysis, we categorized these variables. All other variables were categorized by WHO.

Preliminary life tables show a first-year failure probability of 3.1 percent among those who always used the ovulation method perfectly and of 38.4 percent among those who used the method imperfectly during at least one cycle. The probability of failure during the first year of perfect use (including the perfect-use cycles of the imperfect users) is 3.2 percent, which, as expected, is virtually identical to the result for those who always used the ovulation method perfectly. The probability of failure during the first year of imperfect use is 85.0 percent; this is a much higher probability (as expected) than that found for those who used the ovulation method imperfectly at least once (38.4 percent), because in the latter case, the likelihood of failure is reduced substantially by cycles of perfect use. This probability of failure is extremely high, almost as high as the proportion (about 89 percent) who conceive within one year of trying to become pregnant.[21] The ovulation method is very unforgiving of imperfect use.

Given these preliminary results, we confine attention henceforth to analyses in which perfect vs. imperfect use was defined for each cycle and not for each couple. Further analysis reveals that duration of use does not add significant explanatory power to these models. Hence, all cycles of use can be combined and a simple Pearl index (events divided by exposure) suffices for our purposes here. However, we emphasize that duration is important when the covariate perfect vs. imperfect use is omitted from the model, with failure rates declining as duration increases. Therefore, even these data should be analyzed with life-table procedures unless one controls for consistency and correctness of use. This warning would apply even more strongly if the data were not limited to only 13 cycles of exposure.

Table 3 (page 70) shows Pearl indices for various definitions of imperfect use. The overall probability of pregnancy is 1.7 percent per cycle—0.2 percent during cycles characterized by perfect use and 14.2 percent during those characterized by imperfect use. These failure probabilities per cycle can be cumulated to yield a 20.4 percent probability of failing during the first year; the estimated first-year probabilities of failing during perfect (3.1 percent) and imperfect (86.4 percent) use are nearly identical to the life-table probabilities (3.2 percent and 85.0 percent, respectively) because, as discussed previously, there is no significant variation in per-cycle rates by duration of use.

In Table 3, the first section under the heading "disobeyed rules" shows the risk of pregnancy when particular rules are broken, regardless of whether other rules

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*Details concerning imputations are available from the first author.

†The number of failures, conditional on exposure, is assumed to be Poisson distributed with mean $N_i\exp(X_i\beta)$, where N_i is the exposure in group i, X_i is a vector of characteristics for group i and β is the associated vector of regression coefficients.

Table 3. Number of pregnancies, number of cycles and percent failing during use of the ovulation method, by adherence to rules

Adherence to rules	Pregnancies	Cycles	% per cycle	% per year*	Confidence interval†
TOTAL	130	7,484	1.7	20.4	17.2–23.4
Obeyed rules	16	6,683	0.2	3.1	1.6–4.5
Disobeyed rules	114	801	14.2	88.4	80.5–90.6
Broke this rule and perhaps others					
Consecutive dry days	13	218	6.0	55.0	31.1–71.1
Mucus/wet days	62	178	34.8	99.6	98.6–99.9
Three days after peak	47	209	22.5	96.4	90.9–98.6
Genital contact on wet days	9	106	8.5	68.4	34.3–85.5
Bleeding/spotting	9	232	3.9	40.2	16.7–57.5
Situations of stress	23	41	56.1	100.0	99.9–100.0
Broke only this rule					
Consecutive dry days	5	155	3.2	34.7	5.6–55.3
Mucus/wet days	28	91	30.8	99.2	95.5–99.9
Three days after peak	26	128	20.3	94.8	84.5–98.4
Genital contact on wet days	1	75	1.3	16.0	0.0–40.6
Bleeding/spotting	2	157	1.3	15.4	0.0–33.0
Situations of stress	3	8	37.5	99.8	68.6–100.0‡
Broke any of these rules (and perhaps others)					
Wet days, after peak, or stress	104	375	27.7	98.5	96.8–99.4
All others	10	426	2.3	26.6	11.2–39.4
Wet days, after peak, or consecutive dry	105	539	19.9	94.0	89.9–96.6
All others	9	262	3.4	36.5	14.9–53.0
Wet days, after peak, consecutive dry, or stress	109	548	19.9	94.4	90.5–96.8
All others	5	253	2.0	22.9	3.3–38.7

*Calculated as $100x(1-[1-P]^{13})$, where P is the probability per cycle (# pregnancies/# cycles).

†Annual 95% confidence interval computed from cycle confidence interval based on normal approximation.

‡Annual 95% confidence interval computed from cycle confidence interval based on exact binomial.

are broken simultaneously. The second section displays the risk when only one rule is broken. These results suggest that having intercourse is particularly risky on mucus days, during the three days after the peak day or during periods of stress; in the remainder of this article, prohibitions against having intercourse under those conditions will be referred to as the three most serious rules. Among those whose imperfect use consists of breaking one or more of these three rules in every cycle, 98.5 percent would become pregnant in the first year. In contrast, having intercourse during the menstrual period or having "genital contact" during mucus days carries far less risk; having intercourse on consecutive dry days incurs a risk intermediate between the very high risk and lower risk behaviors.

It is surprising that having intercourse during times of stress incurs such a high risk. Stress presumably disrupts the link between changes in the quality of cervical mucus and ovulation. A plausible hypothesis is that stress delays ovulation but not the estimated peak fecund day, which is identified retrospectively as the last day on which slippery mucus is observed. Hence, when intercourse is timed according to the ovulation method rules to resume on or soon after the evening of the fourth day past the estimated peak, the timing actually coincides with the period of maximum risk of conception. Further research is needed to discover whether having intercourse during periods of stress is indeed as risky as our results imply and, if so, why.

In Figure 1, we use results from Table 3 to simulate the probability of contraceptive failure within one year, depending on the number of cycles in which the ovulation method is used imperfectly. For illustrative purposes, we focus on three types of imperfect use: serious imperfect use (breaking one or more of the three most serious rules), which incurs a risk of 27.7 percent per cycle; less serious imperfect use (breaking rules other than the three most serious ones), which incurs a risk of 2.3 percent per cycle; and typical imperfect use (in which the mix of broken rules mirrors that in the WHO trial), which incurs a per-cycle risk of 14.2 percent. When the only imperfect use is of the less serious variety, the probability of accidental pregnancy per year rises almost linearly from 5.1 percent (if only one use cycle is imperfect) to 26.6 percent (if all 13 cycles are characterized by imperfect use). For the other two varieties of imperfect use, the corresponding curves rise much more rapidly when the number of imperfect-use cycles is small than when the number is already large, because the per-cycle risks are so large. Stated in a different way, with only two cycles of serious imperfect use (49.1 percent) or with only four cycles of typical imperfect use (47 percent), the yearly probability of failure reaches about one-half what it is after 13 cycles of serious imperfect use or typical imperfect use.

Our next step is to test the hypothesis that in addition to perfect vs. imperfect use, only age and coital frequency would be significant explanatory variables of failure for the ovulation method. Exploratory analysis revealed that separate models should be estimated for perfect use, for all imperfect use and for serious imperfect use (when one or more of the three most serious rules were broken). The most surprising finding is that for each of these use groups in models including only age and coital frequency as explanatory variables, coital frequency never adds significant explanatory power.

That finding is not simply the result of a reduction in the precision of the effects estimates caused by the lack of information on coital frequency during those cycles for which women did not record all acts (about half the total number of cycles). In addition to the fact that the effects estimates were almost never significantly different from zero, the results for coital frequency categories 1–2, 3–4, 5–6 and 7 or more times per cycle showed no consistent pattern.* Moreover, responses to an auxiliary question on average frequency of intercourse per week, which are missing much less often, yield equally inconsistent results. We are unwilling, however, to abandon our hypothesis that increased frequency of intercourse will result in a greater likelihood of failure and believe that the results raise suspicions about the accuracy of reporting of coital frequency.

Next, to discover which of the variables shown in Table 2 were significant predictors of failure, we added them sequentially to the models that included age and coital frequency. Only one variable—country of residence—proved important. Country-specific predicted probabilities of failure during the first year are shown in Table 4. During perfect use, there were no failures reported by women in India or El Salvador. Further tests revealed that among the remaining women, failure rates during perfect use did not differ between those aged 28–34 and those 35 and older or between women in New Zealand and those in Ireland. Also, further tests revealed that for both imperfect use and serious imperfect use, pooling the experiences of women from New Zealand, Ireland and the Philippines resulted in no loss of explanatory power. Moreover, age added no explanatory power during serious imperfect use.

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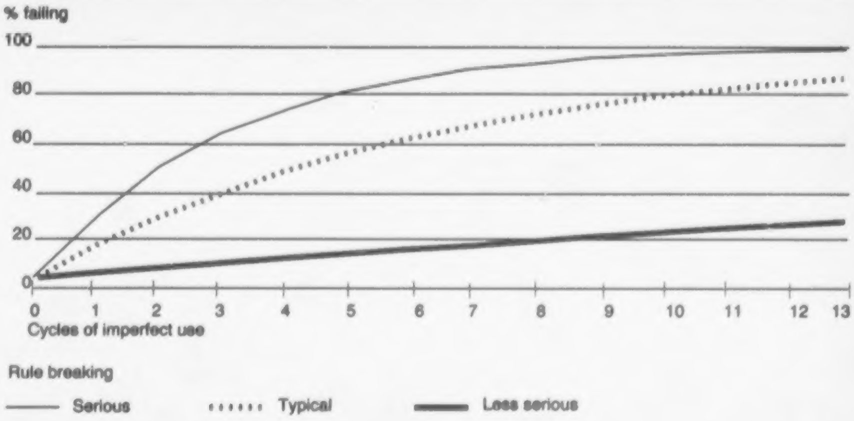
*Coital frequency is significant in a model in which it is the only covariate. However, even in this model, the effect estimates for 3–4 times per cycle and seven or more times per cycle are not significantly different from the effect estimate for 1–2 times per cycle. Only the effect estimate for 5–6 times per cycle is significant, and it is significantly lower (not higher) than the effect estimates for the other three categories.

We are troubled that the probability of failure during perfect, imperfect and serious imperfect use is affected by country of residence. This variable undoubtedly reflects cultural differences in reproductive and sexual behavior and may be serving as a proxy for real differences in coital frequency and the underlying fecundity of those who chose to participate in the trial. However, the finding may also simply reveal cultural differences in misreporting of rule breaking. We are dissatisfied with this result precisely because it is so difficult to interpret; furthermore, we reason that location should not matter if the proximate determinants are properly measured.

Figure 1. Annual probability of failure of the ovulation method, by type of rule breaking, according to number of cycles of imperfect use



Notes: Annual probability of failure calculated as $1-[(1-P_p)^{13-n}(1-P_i)^n]$, where n is the number of cycles of imperfect use and P_p and P_i are the per-cycle probabilities of failure during perfect and imperfect use. $P_p = 0.0024$; P_i takes the values 0.277 for serious imperfect use, 0.023 for less serious imperfect use and 0.142 for typical imperfect use. Serious imperfect use means breaking any of the rules forbidding intercourse on wet days, within three days after peak or during stress. Less-serious imperfect use means breaking any rule in Table 3 other than those three. Typical imperfect use means breaking any ovulation method rule, with the mix of rules broken mirroring the experience of women in the WHO trial.

Risk Takers and Non–Risk Takers

In this part of our analysis, we examine risk-taking behavior itself, because it is such a central issue in the success or failure of the ovulation method. Because we are concerned with risk-taking and not with imperfect use resulting from poor understanding of the ovulation method, we will focus on conscious deviations from the ovulation method rules. We embed our investigation in the analytical framework constructed by Kristin Luker, who argues that women who take contraceptive risks lack neither information (as contraceptive ignorance theory implies) nor rationality (as intrapsychic conflict theory implies).[23] She argues instead that women are constantly bargaining tacitly with themselves "to determine the costs and benefits of contraception, the costs and benefits of pregnancy, the likelihood that pregnancy will occur" and the possibility that pregnancy can be terminated.[23]

Given the widespread appeal of this theory, the relative dearth of empirical tests of its validity is surprising. An analysis of data from a study of 221 sexually active female college students found that risk-taking is not affected by the subjective expected benefits and costs of contraceptive use and pregnancy or the subjective likelihood of abortion.[24] It did support other research that identifies the woman's belief in her chances of becoming pregnant as an important determinant of risk-taking. The analysis concludes that Luker's theory does not work because people are simply unable to choose consistently when faced with even moderate complexity or uncertainty.

We find these results unconvincing, however, because the investigators' measures of both risk-taking and past risk-taking are so limited. Risk-taking was measured by a question on the number of times during the past month that intercourse occurred without contraceptive use. Responses were retrospective, pertained to only one month and did not distinguish unprotected coitus at midcycle from unprotected acts of intercourse at less risky times. The only measure of past risk-taking was "having ever been pregnant," with no distinction between intended and unintended pregnancies. A second study, which does not suffer from the same defi-

Table 4. Percent failing during use of the ovulation method, by type of use and woman's age, according to country

Type of use and woman's age	Ireland and New Zealand		India		El Salvador		Philippines	
	Per cycle	Per year	Per cycle	Per year	Per cycle	Per year	Per cycle	Per year
Perfect use*								
≤27	1.4	17.2	0.0	0.0	0.0	0.0	0.2	2.0
≥28	0.4	5.4	0.0	0.0	0.0	0.0	0.0	0.6
Imperfect use†								
≤27	12.6	82.5	46.0	100.0	86.9	100.0	12.6	82.5
28–34	7.7	64.6	30.7	99.1	70.1	100.0	7.7	64.6
35–38	3.9	40.5	16.8	90.8	45.4	100.0	3.9	40.5
Serious imperfect use‡								
All ages	15.3	88.5	70.9	100.0	70.9	100.0	15.3	88.5

*Goodness of fit: X^2 against saturated model=5.53 with 11 degrees of freedom; p=0.90.

†Goodnes of fit: X^2 against saturated model=11.21 with 10 degrees of freedom; p=0.34.

‡Goodness of fit: X^2 against saturated model=15.95 with 13 degrees of freedom; p=0.25.

ciencies, analyzed data gathered prospectively over a three-year period from approximately 1,000 18–27-year-old women living in the San Francisco area.[25] It found that perceived attitudes toward pregnancy and contraception and the perceived risk of conception were related in the expected manner to consistency of contraceptive use.

Although we cannot execute a strict empirical test of Luker's theory, we instead use it to frame our expectations. The WHO investigators did not collect all the information pertinent to Luker's model, particularly information on attitudes toward abortion. However, given that only 3.7 percent of pregnancies were aborted, 83 percent of all subjects were Catholic and 41 percent of subjects chose the ovulation method specifically for religious reasons, it is likely that most women in the WHO trial did not view terminating a pregnancy as a realistic option.

Using logit regression,[*] we explore which subgroups of the population are more likely to take risks by consciously breaking the ovulation method rules. We would expect that those who themselves or whose partners desire intercourse more frequently than the ovulation method rules allow and those who themselves or whose partners are more dissatisfied with the method would be more likely to take a risk: These are the couples who would perceive the benefit of using the ovulation method as low. We would expect that couples who definitely want no more children (limiters) would be less likely to take risks than would those who seek to delay the next wanted birth (spacers), because limiters would assign higher cost to pregnancy than would spacers. For similar reasons, we would expect that older women and those whose partners are not regularly employed would be less likely to take risks.

Because all women in the study had conceived and delivered at least one child, all were aware that they were fecund. Given the intensive training period in the ovulation method trial, one might expect that all subjects would have a common (although, given the results in the previous section, perhaps not entirely realistic) perception of the risk of pregnancy should the ovulation method rules be broken. One might reason further that couples would perceive that breaking some rules (such as no intercourse during menses) is less likely to lead to pregnancy than is breaking other rules (such as no intercourse during slippery-mucus days). Specifically, educated couples might be more likely to take "innocuous" risks.

Fortunately, the WHO data for the ovulation method are detailed enough that we can explore alternative definitions of risk-taking (ranging from consciously breaking any rule to breaking the most serious rules). Luker strongly objects to the notion that women can be immutably classified as either successful or unsuccessful contraceptive users and that these two types can be differentiated by emotional maturity, future time perspectives or results on standardized psychological tests. She stresses that women constantly interpret facts about "average" women in light of their own unique experience. Thus, for women who take risks and do not become pregnant, risk-taking behavior is reinforced.

Our analysis avoids the strict dichotomous classification to which Luker objects by modeling the "dynamic updating" process that she describes. Instead of using the woman as the unit of observation, our unit of analysis will be a cycle of use, with each woman contributing up to 13 observations.[†] We model the dynamic updating process by including "got away with taking a risk last cycle" and "got away with taking a risk in the next-to-last cycle" as dichotomous covariates. More complex information on past behavior could easily be incorporated, but these two measures should be sufficient to produce clinically useful information. Note that a finding that prior risk-taking is associated with subsequent risk-taking does not necessarily confirm the Luker dynamic updating hypothesis because one would also find such an association if there were a couple-specific effect (propensity to take risks) that is constant over time but varies across couples. Nevertheless, for clinical purposes, what matters more is that past risk-taking predicts future risk-taking; those who take risks can be warned of the consequences, regardless of why they take risks.

With complete data, one might distinguish empirically a couple-specific effect from a dynamic updating process whereby couples who take a risk in the current cycle increase their propensity to take a subsequent risk if pregnancy does not occur but decrease their propensity if pregnancy does occur. In contrast to dynamic updating, couple-specific effects imply that the probability of further risk-taking is independent of whether pregnancy occurred during risk-taking. Under our sampling scheme, however, those who become pregnant disappear from observation. Hence, distinguishing between the two hypotheses becomes more difficult. Nevertheless, the competing hypotheses imply two differing properties that suggest formal tests. First, if only dynamic updating operates, the fraction taking risks should increase over time; if only a couple-specific effect is present, the fraction taking risks will decrease over time as those with the greatest probability of taking risks are removed from the sample by pregnancy. Second, under dynamic updating, the likelihood of taking a first risk should be constant over time, whereas with couple-specific effects the probability of taking a first risk should diminish as time passes, again because of selection. It is likely that both processes (selection and updating) operate, thereby making an assessment of their relative contributions less precise.

It is possible that other socioeconomic and demographic characteristics are associated with risk-taking, so we examine these less proximate determinants as well. The descriptive statistics for potential explanatory variables are displayed in Table 2. We first examined the predictors of any forms of conscious risk-taking, regardless of whether serious or less serious rules were broken; although rules were broken in 801 cycles, they were consciously broken in only 654 cycles. The upper half of Table 5 (page 74) presents our final model, which contains only the variables that add significant explanatory power. When variables have fewer categories than are shown in Table 2, tests revealed that collapsing categories did not result in significant loss of explanatory power.

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[*] The probability P_i that couples in group i will take a risk is expressed as $P_i=[1+\exp(-X_i'\beta)]^{-1}$, where X_i is a vector of characteristics for group i and β is the associated vector of regression coefficients. It can be verified that the logit or log-odds is a linear combination of the predictors: $\log_e[P_i/(1-P)]=X_i'\beta$.

[†] One might object to this strategy because of the expectation that there will be an effect for each couple, so that cycles cannot be analyzed as if they were independent observations. In fact, we have two strata: the cycle and the couple. We stress, however, that we do not assume that cycles are independent because we incorporate variables measuring prior risk-taking (lags) in our model. Another approach would be to include a couple-specific fixed effect in a conventional logit analysis, but doing so would entail the estimation of hundreds of nuisance parameters. A preferable alternative is to assume that the couple-specific effect is random. Then one must estimate only the parameters of the distribution assumed for the unobservable couple-specific effect (or the distribution may be left unspecified and estimated by nonparametric maximum likelihood [see: D. Follmann and D. Lambert, "Generalizing Logistic Regression by Nonparametric Mixing," *Journal of the American Statistical Association*, 84:295, 1989]). Our intuition is that results from a random-effects model are likely to be very similar to and no more clinically useful than results from our model incorporating lags.

Most results conform to expectations. The likelihood of taking a risk is raised by an increase in coital frequency (but not by a desire for greater coital frequency—not shown since not significant[*]), by a desire for more children eventually or by taking a risk in either the last or the next-to-last cycle. Although taking a risk in both the last and the next-to-last cycle increases the probability of taking a risk, as a result of a significant negative interaction between these two variables, the increase in the log-odds is less than the sum of the main effects of risk-taking in each of the two previous cycles. Having an excellent attitude toward the ovulation method rules lowers the probability of taking a risk. Unexpectedly, having a partner who is unemployed or unskilled or who is a student raises the odds of taking a risk.

Country of residence is a factor with great explanatory power. Couples in New Zealand were most likely to take risks, followed by those in Ireland, those in the Philippines, those in El Salvador and those in India. The range is quite large; the odds of taking a risk for couples in New Zealand were nearly 42 times the odds for couples in India.

It is possible, however, that couples who are more likely to take risks take only less serious risks. To answer that question, we focus on serious risk-taking, which includes knowingly violating the three most serious rules—those forbidding intercourse during mucus days, during the three days after the peak and during times of stress. Although these serious rules were broken in 375 cycles, they were consciously broken in only 306 cycles. Although we know that breaking these three rules incurs the greatest risk of pregnancy, couples may not have this knowledge; hence, they may not be consciously breaking the rules they know to be most important. In the bottom half of Table 5, we show the likelihood of taking a serious risk for only those variables that contributed significant explanatory power. As before, when variables have fewer categories than are shown in Table 2, collapsing categories did not result in significant loss of explanatory power.

The results are broadly similar to those shown for all types of risk-taking. The probability of taking a serious risk increases with coital frequency (although there is no difference in the effects of frequencies of 3–6 and seven or more per cycle), but, as before, not when the woman desires greater frequency (not shown since not significant). The probability of serious risk-taking, unlike that of risk-taking overall, is not affected by a desire for more children but is affected by the age and education of the woman. Older women, literate women and women having an excellent attitude toward the ovulation method rules are less likely to take serious risks. As before, the probability of taking a serious risk increases when a serious risk was taken either in the last or in the next-to-last cycle. Moreover, unlike the case with any risk-taking, the log-odds of taking a serious risk when a serious risk was taken in both preceding cycles is increased by the sum of the separate main effects; there is no significant negative interaction. Having a partner who is unemployed, an unskilled laborer or a student raises the probability of taking a serious risk. The pattern by country of residence of the probability of taking serious risks is the same as that for taking any risks. In fact, the relative odds are very similar, except for the couples in New Zealand, whose odds of taking a serious risk, when compared with the odds for other couples, are only about half their odds of taking any risk.

Finally, there is no direct evidence of the dynamic updating process postulated by Luker (results not shown). The fraction of couples taking risks declines as time passes, even after the effects of all factors except prior risk-taking are controlled. This pattern is evident both for any risk-taking and for serious risk-taking, although the declines are not significant in either case.[†] The conditional probability of taking a first risk also declines over time, even after the effects of predictors other than prior risk-taking are controlled. This decline is significant both for any risks and for serious risks. These findings are consistent with selection resulting from unobserved couple-specific effects but are inconsistent with a dynamic updating process. Dynamic updating may well occur, but if so, it is dominated by selection.

A comparison of the two different types of risk-taking yields a number of insights. Wanting more children raises the probability that couples will take risks, but not serious risks. Older and more educated women are as likely as younger and uneducated women to take risks, but the risks they take are the less serious ones. Greater coital frequency, a poor attitude toward the ovulation method rules or having a partner who is unemployed or unskilled or who is a student increases the odds of taking risks in general as well as the odds of taking serious risks; moreover, the odds for these characteristics are about the same for both types of risk-taking. Taking a risk in the previous two cycles increases the odds of taking a risk in the current cycle by a factor of 7.6; taking a serious risk in the previous two cycles increases the odds of taking a serious risk in the current cycle to a far greater extent—a factor of 17.6 (not shown).

It is quite interesting that country of residence so heavily influences the likelihood of taking any risk and the likelihood of taking serious risks, and that the rank order by country is the same for both types of risks. Do these findings simply reflect differences in cultural attitudes toward risk-taking? Or do they suggest differences in the types of couples in each setting who would choose to use the ovulation method or pronounced differences in what the subjects actually learned from their instructors (or what actually was taught)? Or do they reveal differences in misreporting of imperfect use? Further research is needed to answer these questions.

Two variables deserve further discussion. First, the effect of prior risk-taking is understated in Table 5 because no couple could have taken a risk before the first cycle and no couple could have taken a risk two cycles before the first or second cycle. Reestimation of these models after we had discarded the first two cycles confirms that the effect of prior risk-taking is even more pronounced; taking a risk in the two previous cycles increases the odds of taking a risk in the current cycle by factors of 8.7 and 18.4 in models of risk-taking and serious risk-taking, respectively. Second, it is not clinically useful to know that displaying a poor attitude toward the ovulation method rules at the end of a cycle is associated with increased risk-taking in that cycle; indeed, the causation is probably reversed (i.e., taking a risk sours one's attitude). Hence, we reestimated the models (after discarding the first cycle) to see whether a poor attitude toward the ovulation method rules in the previous cycle predicts risk-taking in the current cycle. The results confirm that a

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[*] It is likely that this variable captures two opposite effects. On the one hand, those who desire coitus more frequently might break the rules to approach their desired target. On the other hand, those who obey the rules might be the ones who desire greater coital frequency, whereas those who break the rules attain their desired frequency. A more useful question would have explicitly asked whether the woman (or her partner) desires coitus more frequently *than the rules allow*.

[†] A poor attitude toward ovulation method rules may be the consequence rather than the cause of risk-taking. When the effect of this factor is not controlled, the decline for any risk-taking becomes significant, but the decline for serious risk-taking remains insignificant.

Table 5. Among users of the ovulation method, effects estimates and odds ratios of taking a risk during a cycle, by type of risk-taking and characteristics of user

Type of risk-taking and characteristic	Effects estimate	Standard error	Odds ratio
Any risk-taking*			
Intercept	–2.59	0.13	na
Coital frequency 1–2 or unknown per cycle†			
Coital frequency 3–6 per cycle	0.26	0.12	1.30
Coital frequency ≥7 per cycle	0.72	0.14	2.05
Couple wants no more children†			
Couple eventually wants more children	0.25	0.10	1.28
Partner is not unemployed, unskilled or a student†			
Partner is unemployed, unskilled or a student	0.82	0.18	2.27
Attitude toward rules is not excellent†			
Attitude toward rules is excellent	–2.32	0.14	0.10
Couple did not take risk last cycle†			
Couple took risk last cycle	1.63	0.15	5.12
Couple did not take risk two cycles ago†			
Couple took risk two cycles ago	1.04	0.17	2.83
Couple did not take risk in both of last two cycles†			
Couple took risk in both of last two cycles	–0.64	0.27	7.61‡
Dublin, Ireland†			
Bangalore, India	–1.70	0.19	0.18
Auckland, New Zealand	2.02	0.14	7.50
San Miguel, El Salvador	–0.90	0.22	0.41
Manila, Philippines	–0.29	0.14	0.75
Serious risk-taking§			
Intercept	–2.38	0.32	na
Coital frequency 1–2 or unknown per cycle†			
Coital frequency ≥3 per cycle	0.49	0.14	1.64
Woman aged ≤34 years†			
Woman aged ≥35 years	–0.66	0.18	0.52
Woman is illiterate†			
Woman is literate	–0.68	0.27	0.51
Partner is not unemployed, unskilled or a student†			
Partner is unemployed, unskilled or a student	0.79	0.23	2.20
Attitude toward rules is not excellent†			
Attitude toward rules is excellent	–2.42	0.23	0.09
Couple did not take serious risk last cycle†			
Couple took serious risk last cycle	1.77	0.20	5.89
Couple did not take serious risk two cycles ago†			
Couple took serious risk two cycles ago	1.10	0.23	3.00
Dublin, Ireland†			
Bangalore, India	–1.55	0.25	0.21
Auckland, New Zealand	1.39	0.18	4.00
San Miguel, El Salvador	–0.52	0.29	0.59
Manila, Philippines	–0.29	0.19	0.75

*Goodness of fit: X^2 against saturated model=1,838.0 with 1,999 degrees of freedom; p=0.99. Risk-taking is defined as consciously breaking any rules in Table 3.

†Reference category in logit regression.

‡Includes both main effects and the interaction; OR = exp (1.63+1.04–0.64).

§Goodness of fit: X^2 against saturated model=1,244.6 with 1,734 degrees of freedom; p=1.00. Serious risk-taking is defined as consciously breaking the three most serious rules, which forbid intercourse during mucus/wet days, within three days after peak and during periods of stress.

Notes: All effects estimates and odds ratios significant at p<0.01 using the appropriate one-tailed test, with the following exceptions: In the model for any risk-taking, those for Manila were significant at p<0.05, and in the model for serious risk-taking, those for San Miguel were significant at p<0.05 and those for Manila were not significant; na=not applicable.

poor attitude is a clinically powerful predictor of subsequent risk-taking overall and of serious risk-taking in particular, although the odds are increased by only about 50 percent in the two models (compared with a 10-fold increase in Table 5). We note that the effects estimates for other factors in each of these alternative models do not differ from the effects estimates reported in Table 5.

Conclusion

We strongly suspect that all methods of periodic abstinence will prove to be more unforgiving of imperfect use than will other methods of contraception, because breaking the rules of periodic abstinence involves having unprotected intercourse at times during the menstrual cycle when pregnancy is most likely to occur. The pill is probably the most forgiving (because forgetting to take a pill even in midcycle will not necessarily result in ovulation, much less pregnancy); barrier methods are likely to be less forgiving of imperfect use than the pill but more forgiving than periodic abstinence. Consequently, we believe that method failure rates for periodic abstinence computed by the standard (but incorrect) procedure are less likely to be underestimated than are those for other methods of contraception. User failure rates for periodic abstinence computed by the standard procedure, in contrast, are grossly underestimated.

Four results from this study should be clinically useful in counseling couples about the ovulation method. First and foremost, the efficacy of the ovulation method is high when used correctly and consistently, but the ovulation method is very unforgiving of imperfect use. Second, having intercourse during periods of stress is very risky (contrary to our expectations). Third, those who have a poor attitude toward the rules are likely to take risks, including serious risks. Fourth, those who get away with taking a risk are very likely to take risks, including serious risks, again. Breaking the most serious rules entails a 28 percent risk of pregnancy per cycle. Hence, those who are likely to take risks should be counseled about the serious consequences. Unfortunately, the last result is not helpful in identifying which couples are prone to take risks in their first cycle of use. Nevertheless, it does highlight the importance of a teaching phase during which couples are monitored closely for the first few cycles.

Fortunately, imperfect use is not very common (11 percent of cycles) and serious imperfect use is even less common (five percent of cycles). However, 46 percent of women broke an ovulation method rule (were imperfect users) and 31 percent broke a serious ovulation method rule (were serious imperfect users) in at least one cycle. Moreover, imperfect use is likely to be more common among couples who do not receive intense training and support such as that provided in the WHO clinical trial. Therefore, the ovulation method cannot be regarded as a reasonable contraceptive choice for all women or couples; most would find abstaining for nearly half of each menstrual cycle unacceptable. For this reason, Josef Roetzer, the pioneer of the sympto-thermal variant of periodic abstinence, stresses that "natural conception regulation" is not contraception, but a way of life.[26]

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Induced Abortion: A World Review, 1990

By Stanley K. Henshaw

Summary

The worldwide trend toward liberalization of abortion laws has continued in the last four years with changes in Canada, Czechoslovakia, Greece, Hungary, Romania, the Soviet Union and Vietnam. Forty percent of the world's population now lives in countries where induced abortion is permitted on request, and 25 percent lives where it is allowed only if the woman's life is in danger.

In 1987, an estimated 26 to 31 million legal abortions and 10 to 22 million clandestine abortions were performed worldwide. Legal abortion rates ranged from a high of at least 112 abortions per 1,000 women of reproductive age in the Soviet Union to a low of five per 1,000 in the Netherlands. In recent years, abortion rates have been increasing in Czechoslovakia, England and Wales, New Zealand and Sweden and declining in China, France, Iceland, Italy, Japan and the Netherlands.

In most Western European and English-speaking countries, about half of abortions are obtained by young, unmarried women seeking to delay a first birth, while in Eastern Europe and the developing countries, abortion is most common among married women with two or more children.

Mortality from legal abortion averages 0.6 deaths per 100,000 procedures in developed countries with data. Abortion services are increasingly being provided outside of hospitals, and for those performed in hospitals, overnight stays are becoming less common. National health insurance covers abortions needed to preserve the health of a pregnant woman in all developed countries except the United States, where Medicaid and federal insurance programs do not cover abortion unless the woman's life is in danger.

The United States relies the least on hospitals, with 87 percent of abortions performed outside hospitals in 1985. A majority of abortions are also provided outside hospitals in the Netherlands, Norway, Poland and West Germany.

Laws and Policies

Around the world, laws governing induced abortion range from those prohibiting abortion with no explicit exceptions to those establishing it as a right of pregnant women. In 1986, The Alan Guttmacher Institute (AGI) published *Induced Abortion: A World Review, 1986,* the sixth edition of a series created by Christopher Tietze of The Population Council. That work contained a summary of the legal status of abortion in all countries; statistics on the number and characteristics of women who obtain abortions in countries where such data are available; information about abortion procedures, related morbidity and mortality and the effects of policy changes; and a section on the statistical methods used. The present article updates the data presented in that earlier work and gives an overview of the subject, with an emphasis on the changes that have taken place since 1986.

Table 1 classifies all countries and dependent territories* with populations of one million or more according to the restrictiveness of their abortion laws. Some 53 countries of this size, containing 25 percent of the world's population, fall into the most restrictive category, where abortions are prohibited except when the woman's life would be endangered if the pregnancy were carried to term. In some of the countries in this category, statutes prohibit abortion without explicit exception—even if the life of the pregnant woman is in danger. But in most if not all cases, implicit provisions in the statutes or general principles of criminal law permit abortion to save the life of a pregnant woman.

Forty-two countries of at least one million people, comprising 12 percent of the world's population, have statutes authorizing abortion on broader medical grounds—to avert a threat to the woman's general health (not limited to the risk of losing her life) and sometimes for genetic or juridical indications, such as rape or incest—but not for social indications alone or on request. Some of the statutes permit abortion only when the woman's physical health is threatened, while others explicitly or by interpretation include her mental health as well.

Twenty-three percent of the world's population live in the 14 countries of one million or more people that allow abortions for social or social-medical indications; that is, adverse social conditions can either justify termination of a pregnancy or be considered in evaluating a threat to the woman's health. In many of these countries, including Australia, Finland, Great Britain, Japan and Taiwan, abortion is available virtually on request.

The least restrictive category includes the 23 countries where abortion is permitted on the request of the woman. Some of the world's most populous countries—China, the Soviet Union and the United States, as well as about half of the European countries—are in this category, which

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*In subsequent references, "countries" is used to refer to all areas for which data are presented. Tables with statistics for each country for all available years may be obtained from the author.

contains about 40 percent of the world's population. In Sweden, in the absence of medical contraindications, a woman has a right to have a legal abortion up to the end of the 18th week of gestation. In some of these countries—for example, Sweden and Yugoslavia—abortion is defined explicitly as a right of a pregnant woman.

Even where abortion is available on request, abortion services are generally subject to the restrictions that apply to other types of medical or surgical care. For example, in most if not all countries, abortion services may be provided only by licensed medical personnel and only with the consent of the woman. Many of the countries that permit abortion on request also have gestation limits (as shown in Table 1) beyond which health or other indications are required for the procedure to be permitted. In other countries, abortion is permitted through 24 weeks' gestation (Singapore) or up until viability (e.g., China, the Netherlands and the United States). In Great Britain, the legal gestation limit is 28 weeks, although administrative regulations have, in effect, lowered the limit to 24 weeks.

A variety of other restrictions exist throughout the world, the most common being parental notification or consent for minors, waiting periods, compulsory counseling and the prohibition of abortions in profit-making facilities. According to a recent analysis, spousal authorization requirements exist in several developing countries, including Kuwait, Taiwan and Turkey;[1] however, in countries without statutory provision for spousal consent, there have been no known cases in which "a husband's claim of veto [has] been judicially upheld."[2]

It should be emphasized that the formal classification of the laws does not necessarily reflect their restrictiveness in actual practice. In most Muslim countries and in Latin America and Africa, few legal abortions are performed under the health exception, while in Israel, New Zealand and South Korea, the legal abortion rates are comparable to those in countries that allow abortion on request. Legal interpretations of the same law can even vary widely within a country, as in Switzerland, where the exception for medical reasons is interpreted very liberally in some cantons and very narrowly in others.

Restrictive laws do not necessarily mean that safe abortion services are unavailable. Services may exist despite legal constraints because laws are either interpreted with flexibility or not vigorously enforced or because physicians are willing to risk pros-

Table 1. Countries, by restrictiveness of abortion law, according to region, January 1, 1990

Law	Africa	Asia & Oceania	Europe	North America	South America
To save a woman's life	Angola Benin Botswana Burkina Faso Central Afr. Rep. Chad Côte d'Ivoire Gabon Libya Madagascar Malawi Mali Mauritania Mauritius Mozambique Niger Nigeria Senegal Somalia Sudan Zaire	Afghanistan Bangladesh Burma Indonesia Iran Iraq Laos Lebanon Oman Pakistan Philippines Sri Lanka Syria United Arab Emirates Yemen Arab Rep. Yemen, Peoples' Democratic Rep.	Belgium Ireland	Dominican Rep. El Salvador*,† Guatemala Haiti Honduras Mexico* Nicaragua Panama	Brazil* Chile Colombia Ecuador* Paraguay Venezuela
Other maternal health reasons	Algeria Cameroon* Congo Egypt† Ethiopia Ghana*,† Guinea Kenya Lesotho Liberia*,† Morocco Namibia*,† Rwanda Sierra Leone South Africa*,† Tanzania Uganda Zimbabwe*,†	Hong Kong*,† Israel*,† Jordan* Korea, Rep. of *,† Kuwait† Malaysia*,† Mongolia Nepal New Zealand*,† Papua New Guinea Saudi Arabia Thailand*	Albania Northern Ireland Portugal*,† Spain*,† Switzerland	Costa Rica Jamaica Trinidad & Tobago	Argentina* Bolivia* Guyana Peru
Social and social-medical reasons	Burundi Zambia†	Australia† India**,†† Japan*,†,§§ Korea, Dem. Rep.*,† Taiwan*,†	Bulgaria*,†,‡ Finland*,†,‡,‡‡ German Fed Rep.*,†,‡‡,*† Great Britain† Hungary*,†,‡,‡‡ Poland*,§§,‡‡		Uruguay*,§
On request	Togo Tunisia‡‡	China Singapore Turkey§§ Vietnam	Austria‡‡,*† Czechoslovakia‡‡ Denmark‡‡ France§§ German Dem. Rep.‡‡ Greece‡‡ Italy‡‡ Netherlands Norway‡‡ Romania‡‡ Soviet Union‡‡ Sweden*‡ Yugoslavia††	Canada Cuba†† Puerto Rico United States	

*Includes juridical grounds, such as rape and incest. †Includes abortion for genetic defects.

‡Approval is automatic for women who meet certain age, marital and/or parity requirements.

§Not permitted for health reasons but may be permitted for serious economic difficulty.

**During the first 20 weeks. ††During the first 10 weeks.

‡‡During the first three months or 12 weeks.

§§No formal authorization is required, and abortion is permitted in doctor's office; thus, abortion is de facto available on request.

*†Gestational limit is for interval since implantation. *‡During the first 18 weeks.

Notes: Table does not include countries with fewer than one million inhabitants or those for which information on the legal status of abortion could not be located (e.g., Bhutan and Kampuchea). All abortions are permitted only prior to fetal viability unless otherwise indicated in footnotes.

ecution. Abortion is restricted in several countries that permit menstrual regulation (a procedure identical to an early abortion but performed without a pregnancy test). The government of Bangladesh, for example, supports clinics that provide menstrual regulations up to 10 or 12 weeks' gestation as a public health measure. Menstrual regulations are also performed in some areas of Indonesia[3] and Malaysia.[4]

Despite a highly restrictive law in Belgium,* abortions are provided through a network of nonhospital clinics as well as in a few hospitals and physicians' offices.[5] Similarly, in Latin America, although abortion providers are sometimes prosecuted, virtually all major cities have physicians who perform abortions and some have clinics that specialize in the procedure.

On the other hand, the absence of restrictions does not guarantee that services will be available. In India and Bangladesh, the overall shortage of medical facilities makes legal abortion and menstrual regulation unavailable to most women. Similarly, despite the relaxation of abortion restrictions in Ghana, and their elimination in Togo, the availability of services has changed little in those African nations. In Zambia, women commonly attempt illegal abortions and then go to a hospital for treatment of complications because few legal abortions can be done under current laws and resource limitations.

From the second half of the 19th century through World War II, abortion was highly restricted almost everywhere. Liberalization of abortion laws occurred in most of the countries of Eastern and Central Europe in the 1950s and in almost all the remaining developed countries during the 1960s and 1970s. A few developing countries also relaxed their restrictions on abortion during the same period, most notably China and India. By mid-1986, abortions could be legally obtained for health reasons in North America and in every European country except Belgium and the Republic of Ireland.

Since then, the trend toward abortion liberalization has continued with changes in seven countries of one million or more. In 1988, the Canadian Supreme Court voided the law allowing abortions only in hospitals and only on medical grounds, and abortions are now legally permitted in

Table 2. Number of abortions, abortion rate per 1,000 women aged 15–44, abortion ratio per 100 known pregnancies* and total abortion rate,† by completeness and reliability of data and country

Type of data and country	N‡	Rate	Ratio	Total rate
Statistics believed to be complete				
Australia (1988)	63,200	16.6	20.4	484
Belgium				
In Belgium§ (1985)	10,800	5.1	8.7	u
All** (1985)	15,900	7.5	12.2	u
Bulgaria (1987)	119,900	64.7	50.7	u
Canada				
In Canada (1987)	63,600	10.2	14.7	299
All†† (1985)	74,800	12.1	16.6	u
China (1987)	10,394,500	38.8	31.4	u
Cuba (1988)	155,300	58.0	45.3	u
Czechoslovakia (1987)	156,600	46.7	42.2	1,400
Denmark (1987)	20,800	18.3	27.0	548
England and Wales‡‡ (1987)	156,200	14.2	18.6	413
Finland (1987)	13,000	11.7	18.0	356
German Democratic Republic (1984)	96,200	26.6	29.7	u
Hungary (1987)	84,500	38.2	40.2	1,137
Iceland (1987)	700	12.0	14.0	336
Netherlands ‡‡ (1986)	18,300	5.3	9.0	155
New Zealand (1987)	5,800	11.4	13.6	323
Norway (1987)	15,400	16.8	22.2	493
Scotland §§ (1987)	10,100	9.0	13.2	255
Singapore (1987)	21,200	30.1	32.7	840
Sweden (1987)	34,700	19.8	24.9	600
Tunisia (1988)	23,300	13.6	9.8	u
United States (1985)	1,588,600	28.0	29.7	797
Vietnam (1980)	170,600	14.6	8.2	u
Yugoslavia (1984)	358,300	70.5	48.8	u
Statistics that are incomplete				
Bangladesh (FY 1989)	77,800	3.4	1.6	u
France*† (1987)	161,000	13.3	17.3	406*‡
German Federal Republic				
In country (1987)	88,500	6.7	12.1	197
All** (1986)	92,200	7.0	12.8	u
Hong Kong (1987)	17,600	12.7	20.1	u
India (FY 1987)	588,400	3.0	2.2	u
Ireland*§ (1987)	3,700	4.8	5.9	139
Israel (1987)	15,500	16.2	13.5	u
Italy (1987)	191,500	15.3	25.7	460
Japan (1987)	497,800	18.6	27.0	564
Poland (1987)	122,600	14.9	16.8	u
Romania†* (1983)	421,400	90.9	56.7	u
Soviet Union (1987)	6,818,000	111.9	54.9	u
Estimates based on surveys or other data				
Bangladesh (FY 1986)	241,400	12	5	u
Japan (1975)	2,250,000	84	55	u
South Korea (1984)	528,000	53	43	u
Soviet Union (1982)	11,000,000	181	68	u
Spain (1987)	63,900	8	u	u
Switzerland (1984)	13,500	9	15	u
Turkey (1987)	531,400	46	26	u

*Known pregnancies are defined as legal abortions plus live births. Births have not been lagged by six months because the necessary birth data are unavailable for most countries.

†The number of abortions that would be experienced by 1,000 women during their reproductive lifetimes, given present age-specific abortion rates.

‡Rounded to the nearest 100 abortions.

§Abortions performed in 17 hospitals and 20 nonhospital facilities, usually illegally.

**Including abortions obtained in the Netherlands and England.

††Including abortions obtained in Canadian clinics and in the United States. ‡‡Residents only.

§§Including abortions obtained in England. *†Provisional data. *‡1986 data.

*§Based on Irish residents who obtained abortions in England.

†*Combining counts of illegal abortions with treated complications and of legal abortions.

Notes: Sources of country data for this table and subsequent tables available from author; u=unavailable.

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*Since this was written, the Belgian parliament has passed a law that permits abortions up to 14 weeks in approved facilities if the woman is "in distress," with a six-day wait between the first consultation and the abortion. After 14 weeks, abortions are permitted in cases of danger to the woman's health and fetal malformation.

that country on request. However, although abortions are easier to obtain in some hospitals that have eliminated their committee approval requirements, few nonhospital facilities have begun offering services, and some provinces have taken steps to discourage abortions by restricting insurance payments to those performed in hospitals or by prohibiting abortions outside of hospitals.

In 1986, the two republics that make up Czechoslovakia passed laws that eliminated the requirements that abortions be approved by a committee and be performed for medical or social reasons only.[6] Abortions are now available on request through 12 weeks of pregnancy and up to 24 weeks for fetal defects or if the woman's life would be threatened by continuing the pregnancy. Greece also revised its abortion law in 1986 and legalized first-trimester procedures on request.[7] Previously, abortions were technically illegal but had been readily available from physicians.

The abortion law in Hungary has been liberalized to permit abortions on request to married women with two living children (reduced from at least three children), and the approval of a committee is no longer needed. As before, abortion is permitted for women who have health, fetal defect or juridical indications, are unmarried, have been separated for at least six months, are older than 35 or have inadequate housing. Women not meeting the above conditions may apply for approval if they have another "social reason" for terminating the pregnancy.[8]

First-trimester abortions had been available on request in Romania from 1957 to 1966. Then in 1966, the government imposed severe restrictions on abortion, prohibited the importation of contraceptives and took other measures to encourage population growth; illegal abortions became increasingly common in succeeding years, reaching a higher rate than in any Western European country in which abortion was legal, according to official government statistics. In 1986, Romania renewed measures to suppress abortion and taxed both unmarried persons over age 25 and married couples who remained childless for more than two years without a medical reason.[9] According to press reports, the new Romanian government lifted the 1966 and 1985 restrictions on abortion as of January 1, 1990.[10]

In Vietnam, all reference to abortion was omitted from the criminal law in 1986, although abortion on request was already legal.[11] In addition, the grounds for second-trimester abortions have been broadened in the Soviet Union to include a number of social indications, reportedly to reduce the number of illegal procedures.[12]

In addition to the countries named above, all of which have populations of one million or more, several smaller states have liberalized their abortion laws, including Cape Verde, Cyprus, French Polynesia and Liechtenstein. Only the Philippines and the United States have passed restrictive measures at the national level since 1986: The Philippines incorporated a clause into its 1986 constitution stating that the state shall "protect the life of the mother and the life of the unborn from conception,"[13] and the United States Supreme Court weakened the constitutional guarantees of abortion rights in *Webster* v. *Reproductive Health Services* in 1989.[14]

Between 1986 and 1990, restrictions on abortion at the state level increased somewhat in the United States. The most important changes were the discontinuation of public funding (Medicaid) for poor women in Michigan and the District of Columbia (except in cases of life endangerment), leaving such funding available in only 13 states. Five more states have been added to the nine with parental notification or consent requirements (or, alternatively, a court order) for women under age 18; and abortions have been prohibited in government hospitals and clinics in Missouri and Pennsylvania (in addition to Kentucky and North Dakota, which already had such restrictions in place).

The full impact of the *Webster* decision has not yet been felt; some states are still considering new legislation, and some restrictions are temporarily enjoined while constitutional challenges are being debated. The Supreme Court's language suggests that more severe restrictions than those considered in the *Webster* case might now be upheld as constitutional. Even if the court overturns *Roe* v.*Wade*, thereby eliminating protection for abortion rights in the federal constitution, abortion will remain legal and available in many or most states because of the protection guaranteed under state constitutions or because of decisions made in state legislatures.

Incidence of Abortion

Table 2 shows the abortion numbers, rates and ratios among countries with populations of more than 300,000 for which official statistics could be obtained or for which estimates are available.* Not surprisingly, the most complete and accurate data available are those for developed countries and countries where abortion is legal. The first panel lists countries with data thought to be accurate within 20 percent of the true incidence, as well as a few countries for which there is limited evidence as to accuracy. The data were compiled primarily by government agencies and were obtained either from published reports or from persons with access to official statistics.

The middle panel of Table 2 contains official statistics that are probably low by at least 20 percent because of unreported legal abortions (in Bangladesh, France, the Federal Republic of Germany [West Germany], India, Italy,† Japan, Poland and the Soviet Union) or illegal abortions (in Bangladesh, India and probably the Soviet Union). The figures for Ireland include only those women who obtained an abortion in England and gave an Irish address; the number who gave an English address is unknown. The Romanian data reflect mainly illegal abortions and may either underestimate or overestimate true incidence; they exclude illegal abortions that did not require treatment but may include spontaneous abortions that were treated.

The data in the bottom panel, derived from a variety of sources, may be incomplete. Still, they indicate the magnitude of abortion incidence in a few populous countries and may be more accurate than the official statistics for Bangladesh, Japan and the Soviet Union. The figures for Bangladesh[15] and Spain[16] are derived from surveys of abortion providers and are probably fairly complete for legal abortions, but large numbers of illegal procedures are omitted, especially in the Bangladesh data. The Japanese data[17] are based on national projections for 1975 made from districts in which reporting was believed to be complete; the estimate of 2.3 million is about three times the official reported number for that year. The estimates for South Korea[18] and Turkey[19] are derived from population surveys that asked married women about their histories of legal and illegal abortions. The estimated abortion numbers and rates for these countries are thus conservative, since induced abortions tend to be underreported even in communities where the practice is widely accepted.[20] The estimates for the Soviet Union[21] may also have some downward bias because of underreporting, although the survey on which they are based was conducted only in the Russian Republic, which has a higher official abortion rate than the other Soviet republics. For Switzerland, 54 percent of the data are statistics from cantons that collect data, and the rest are estimates.[22]

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*Scotland is included as a separate country because complete, accurate statistics are available and because its utilization of abortion differs from that of England and Wales.

†In Italy and possibly other countries, the unreported abortions are technically illegal even if performed by a physician, because reporting and other administrative requirements are not met.

Of the countries shown in Table 2, the Soviet Union has the highest abortion rate—112 per 1,000 women aged 15–44, as calculated from official data. That nation's abortion ratio is also high; officially, 55 percent of all known pregnancies are terminated by abortion, but because of illegal abortions and unreported legal abortions, the true rate is probably higher than the official figures indicate.[23] The survey results shown in Table 2 produce an estimate of 181 abortions per 1,000 women of reproductive age, suggesting that a significant proportion of abortions are performed outside the official system. Within the Soviet Union, the republics vary widely in abortion utilization; for example, in 1985, the abortion ratio calculated from official statistics ranged from 66 percent of pregnancies ending in abortion in the Russian Republic to 18 percent in Tadzhik.[24]

Abortion rates and ratios are relatively high in the Eastern and Central European countries as well, where rates range from 27 per 1,000 women of reproductive age in the German Democratic Republic (East Germany) to 71 per 1,000 in Yugoslavia. Except for East Germany, these countries have a history of reliance on abortion, which was legalized in the 1950s before modern contraceptive methods were fully developed. In addition, the full range of modern contraceptive methods is not readily available in most of Eastern and Central Europe and the Soviet Union. In Japan, hormonal methods have been approved for medical purposes (regulating menses) but not for contraception. The Japanese abortion rate is also estimated to be relatively high, although it has probably fallen below the rate of 84 per 1,000 women aged 15–44 estimated for 1975.

Abortion rates in most of the remaining developed countries range from 11 to 20 per 1,000 women of reproductive age, although the U.S. rate is higher (28 per 1,000). Italy's rate is probably well above this range also when unreported abortions are taken into account.[25] The rates for the Netherlands, Scotland and Switzerland are below the range found in most developed countries. Those reported for Belgium and Ireland—countries that have very restrictive laws—are also low, but are not significantly lower than the rate for the Netherlands, a country with one of the world's most liberal abortion laws. The low rate reported for Spain, where clinics have just begun to provide services, is based on a survey that might have missed some providers and that excludes illegal abortions.

Table 3. Number of legal abortions (in 000s), number of associated deaths and mortality rate (95 percent confidence intervals) per 100,000 legal abortions, by country

Country	Abortions	Deaths	Mortality rate
Bulgaria (1980,1984,1987)	373.6	5	1.3 (0.4–3.1)
Canada (1980–1987)	511.0	1	0.2 (0.0–1.1)
Czechoslovakia (1976–1983)	780.5	3	0.4 (0.1–1.1)
Denmark (1976–1987)	269.3	2	0.7 (0.1–2.7)
England and Wales (1980–1987)	1,094.8	14	1.3 (0.7–2.1)
Finland (1976–1985)	154.1	2	1.3 (0.2–4.7)
Hungary (1980–1987)	648.9	5	0.8 (0.2–1.8)
Netherlands (1976–1983)	509.0	1	0.2 (0.0–1.1)
New Zealand (1976–1987)	74.0	0	0.0 (0.0–5.0)
Norway (1978–1982)	70.1	0	0.0 (0.0–5.3)
Scotland (1976–1987)	101.0	2	2.0 (0.2–7.1)
Sweden (1980–1987)	261.2	1	0.4 (0.0–2.1)
United States (1980–1985)	9,445.9	54	0.6 (0.4–0.7)

Note: Deaths attributed to legal abortion on death certificate, except for England and Wales (where deaths are recorded on the form for abortion notification) and the United States (where deaths are associated with abortion after investigation by the Centers for Disease Control).

Abortion rates tend to be higher in those developing countries with liberal abortion laws than in the developed countries, although there is a wide variation in rates. Cuba, South Korea and Turkey have rates of over 40 abortions per 1,000 women of reproductive age. Tunisia, on the other hand, has the relatively low rate of 14 per 1,000, in spite of a liberal law and government-supported services. (The Tunisian statistics, however, omit legal abortions peformed in the private sector; in 1980, these were estimated to equal 15–20 percent of the reported abortions.[26])

The rate of legal abortion (or menstrual regulation) in Bangladesh is relatively low at 12 per 1,000 women of reproductive age because legal services are unavailable in many rural areas, and in others, women are unaware of existing services. Based on the assumption that one abortion death occurs for every 100 illegal abortions, one study used mortality data to estimate that 780,000 illegal abortions are performed each year.[27] If this estimate is accurate, the illegal abortion rate in Bangladesh is three times the legal rate. Many clandestine abortions are performed in India as well because of a similar lack of medical services in rural areas. India's legal abortion rate is probably two to five times the reported rate of three abortions per 1,000 women, since only a fraction of the legal abortions, mainly those in government hospitals, are reported.

The total abortion rate given in Table 2 represents the number of abortions that 1,000 women could expect to have during their reproductive lifetimes, given present age-specific abortion rates. For example, at present rates of abortion in the United States, 1,000 women would have 797 abortions during their lifetime. Czechoslovakia and Hungary have rates over 1,000, meaning that the average woman in those countries would have more than one abortion during her lifetime. If accurate data were available, total abortion rates would probably be as high or higher in Cuba, Japan, South Korea, the Soviet Union, Turkey and Yugoslavia and perhaps other countries as well.

Among countries with complete data for a recent three-year period, usually 1984–1987, legal abortion rates have remained relatively stable in most, but significant changes have taken place in some. The largest increase in the legal abortion rate (35 percent) occurred in Czechoslovakia, and much of that may be attributable to the elimination of abortion approval committees. Legal rates also increased by more than 10 percent in England and Wales, New Zealand and Sweden. One source has suggested that the higher Swedish rate may be a result of an increased emphasis on AIDS prevention that has led to a greater use of condoms at the expense of more effective methods.[28]

Declines in abortion rates occurred in Iceland and the Netherlands. The drop in the Netherlands appears to represent a continuing recovery from the pill scare that caused an increase in abortions in 1980. The number of reported abortions in China fell markedly from 14.4 million in 1983 to 8.9 million in 1984, rose again to 11.6 million in 1986 and then fell to 10.4 million in 1987. While there are some reporting uncertainties, the decline in 1984 could be a consequence of a massive increase in the number of sterilizations and IUD insertions in 1983[29] and of a relaxation of the population control effort in 1984.[30] Declines in abortion rates have also been recorded in three countries with less complete data—France, Italy and Japan; although it is possible that the reporting itself has deteriorated in these countries, it seems more likely that the increased acceptance of modern contraceptive methods has caused real declines. Data from surveys in South Korea illustrate the relationship between abortion rates and contraceptive use. Between 1973 and 1979, both the abortion rate and the contraceptive prevalence rate rose rapidly, reflecting the increased desire of couples to reduce their fertility. But from 1979 to 1985, contraceptive prevalence, especially sterilization, continued to increase, and the abortion rate fell back to its level of 1973.[31]

Since the widespread liberalization of abortion laws, illegal abortions have largely disappeared in most developed countries. However, physicians in Italy, Portugal, the Soviet Union and Spain still perform abortions that do not meet all the requirements of the law and, as such, are not counted as legal abortions. Further, traditional practitioners may still be performing abortions in these countries and in Romania (before 1990) and Yugoslavia because of the persistence of restrictions, legal barriers and local customs.

In developing areas, abortions are commonly performed by both physicians and traditional practitioners whether or not the procedure is legal. In East Asian countries such as Indonesia and Malaysia, physicians provide menstrual regulations while traditional practitioners provide abortions by massage, insertion of objects into the uterus and other folk methods. In Latin America, abortion services are available from physicians in all major cities and in clinics in some areas. (In Rio de Janeiro, for example, there is a chain of abortion clinics that advertises in newspapers, without, however, using the word "abortion.") Nevertheless, because of the cost of these services and their scarcity outside of major cities, many or most abortions in Latin America are probably self-induced or performed by nonmedical practitioners. Cuba, where abortion is available on request, is a notable exception.

In Africa and parts of the Middle East, the desire for large families is still prevalent, and abortion is thought to be less common than in Latin America, where fertility rates have fallen rapidly. Nevertheless, hospital studies indicate that complications of illegal abortions are a major public health problem. For example, Jomo Kenyata Hospital in Nairobi, Kenya, treats 50 to 60 women a day for abortion complications.[32] A community-based study in Addis Ababa, Ethiopia, found that 24 percent of all maternal deaths and 54 percent of those directly related to pregnancy were attributable to complications of clandestine abortions.[33]

According to the numbers in Table 2, approximately 22 million legal abortions were reported in 1987 (or the closest year for which data were available for the countries listed). The number of unreported legal abortions can be estimated at six million—most of these accounted for by India, Japan, South Korea and the Soviet Union*—but this estimate is uncertain and could range from four to nine million. The estimated number of legal abortions performed worldwide in 1987 was approximately 28 million, but may have ranged from 26 million to 31 million. These estimates of the numbers of legal abortions are lower than those made in 1986 (33 million, with a range of 30–40 million) because reported abortions in China declined by four million and newly published abortion statistics for the Soviet Union resulted in a decrease in the maximum estimate for that country.

Information on clandestine abortions is too uncertain to know whether the worldwide total is increasing or decreasing, since few studies in developing countries have provided accurate measures even for small areas. Combining the estimates that other authors have generally used with guesses as to the probable rates of abortion results in rough estimates of clandestine abortions: 500,000 in Bangladesh, 600,000 in the rest of South Asia, 1.5 million in the rest of Asia, 400,000 for Romania, 1.5 million for Africa and approximately two million in the Soviet Union and four million each in India and Latin America. This totals 15 million clandestine abortions, but, again, the uncertainty of the estimates suggests that the number could be as low as 10 million or as high as 22 million. The estimated worldwide total of abortions is therefore between 36 and 53 million, yielding an annual rate of 32–46 abortions per 1,000 women of reproductive age.

Abortion Mortality

The World Health Organization (WHO) has estimated that 99 percent of the 500,000 maternal deaths that occur worldwide annually take place in developing countries; of these, 115,000–204,000 result from complications of illegal abortions performed by unqualified practitioners.[34] A more conservative estimate may be derived from hospital studies that suggest that, on average, 20–25 percent of maternal mortality is attributable to abortion,[35] yielding totals of 100,000–125,000 deaths annually from illegal abortion. The WHO estimates that more than half of the deaths caused by induced abortion occur in South and Southeast Asia; the next largest proportion take place in Sub-Saharan Africa. The numbers are only approximations because of the difficulty in distinguishing between deaths from induced abortion and those from spontaneous abortion in countries where induced abortion is illegal, the problems of generalizing from studies done in particular hospitals and localities and the relatively small number of studies that have been reported. A literature review found the highest reported mortality rate to be 2,400 deaths per 100,000 abortions in a rural area of Bangladesh.[36]

The provision of abortion under modern medical conditions has reduced abortion mortality to an extremely low level in developed countries that have legalized the procedure. Table 3 shows mortality rates in the 13 countries for which accurate numbers of deaths and abortions are known. While the rates range from zero to two deaths per 100,000 legal abortions, the differences between the countries are not statistically significant because the numbers of deaths are so small. The aggregate mortality rate of these countries is 0.6 deaths per 100,000 legal abortions; only in England and Wales is the rate statistically significantly higher, in part because of a relatively high proportion of abortions performed at later gestations.

The stage of pregnancy at which an abortion is performed affects the risk of mortality and complications; regardless of legal status and medical care, the risk of mortality rises with increasing gestation.[37] In 1981–1985 data for the United States, for example, deaths per 100,000 legal abortions rise from 0.2 at eight or fewer weeks since the last menstrual period to 0.3 at 9–10 weeks, 0.6 at 11–12 weeks, 3.7 at 16–20 weeks and 12.7 at 21 weeks or more.[38] In the developed countries, the risk of mortality from abortion has declined consistently since abortion was legalized; in all countries for which we have earlier data than those shown in Table 3, mortality rates were higher. In developed countries where induced abortion is legal, the procedure is now safer than pregnancy and childbirth. During 1981–1985 in the United States, the maternal mortality rate excluding deaths from abortion and ectopic pregnancy was 6.6 deaths per 100,000 live births, a rate that is 11 times that associated with legal abortion.[39]

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*In making estimates for the Soviet Union, the difference between the seven million abortions reported and the 11 million estimated to have occurred (see Table 2) was assumed to be due half to unreported legal procedures and half to illegal abortions.

Table 4. Percentage distribution of legal abortions, by weeks of gestation, according to country

Country	≤8	9–12	13–16	≥17	Total
Canada (1987)	33.2	55.3	8.0	3.5	100.0
Czechoslovakia (1987)	84.7	15.0	0.2	0.2	100.0
Denmark* (1988)	40.9	56.7	1.0	1.3	100.0
England and Wales					
Residents (1987)	34.5	52.5	8.5	4.5	100.0
Nonresidents (1987)	25.9	33.3	17.7	23.1	100.0
Finland (1987)	54.5	40.5	2.9	2.0	100.0
France (1986)	55.4	42.8	1.5	0.3	100.0
Hungary (1987)	67.8	30.7	0.8	0.7	100.0
India (FY 1983)	u	85.0†	15.0‡	u	100.0
Italy (1987)	49.5	49.8	0.7‡	u	100.0
Japan§ (1987)	52.4	41.1	3.3	3.2	100.0
Netherlands					
Residents** (1986)	69.8	21.5	6.0	2.7	100.0
Nonresidents** (1986)	42.8	29.4	17.6	10.2	100.0
New Zealand (1988)	23.0	69.8	5.9	1.3	100.0
Norway (1987)	45.0	52.5	2.0	0.5	100.0
Scotland†† (1987)	46.8	42.4	8.6	2.2	100.0
Singapore (1987)	72.4	24.0	2.5	1.1	100.0
Sweden (1987)	41.1	54.6	3.1	1.2	100.0
United States‡‡ (1985)	51.5	39.6	5.2	3.7	100.0

*Ordinal weeks. †Distribution is for ≤12 weeks. ‡Distribution is for ≥13 weeks.

§Distribution is for ≤7 weeks, 8–11 weeks, 12–15 weeks and ≥16 weeks.

**Abortions performed in clinics only.

††Distribution is for ≤9 weeks, 10–13 weeks, 14–17 weeks and ≥18 weeks.

‡‡Last two categories are 13–15 weeks and ≥16 weeks (see S. K. Henshaw and J. Van Vort [reference 36] for estimation methods).

Notes: In this and subsequent tables, abortions for which distribution data are unknown are assumed to have the same distribution as those for which data are known. Gestation is measured from the first day of the last menstrual period; u=unavailable.

The possible effects on maternal mortality of the legal restrictions on abortion can be seen in Romania, where most abortions were prohibited in 1966. Between 1965 and 1984, abortion mortality rose from 21 deaths to 128 deaths per 100,000 live births. Over the same period, maternal mortality from other causes fell from 65 deaths to 21 deaths per 100,000 live births.[40] In 1984 alone, the WHO reports that there were 449 abortion deaths in Romania.[41]

Other Health Issues

For first-trimester abortions in most Western developed countries, the traditional sharp curettage method (dilatation and curettage, or D&C) has been largely replaced by suction curettage (vacuum aspiration). The latter method requires less cervical dilatation and has less risk of uterine injury and retention of products of conception.[42] In the latest year for which data are available, more than 95 percent of curettage abortions were performed by suction in Denmark, England and Wales, Finland, France, the Netherlands, Sweden and the United States. By comparison, higher proportions of sharp curettage procedures were performed in Hungary (52 percent), Czechoslovakia (30 percent), West Germany (20 percent), Italy (18 percent) and Singapore (seven percent), and the use of sharp curettage is reportedly still common in the Soviet Union.

In developing countries where abortion is legally restricted, most physicians are not trained in suction curettage and do not have the necessary equipment, so office procedures are usually done by sharp curettage. Suction curettage is sometimes used, however, where large numbers of abortions are performed in clinics.

Second-trimester abortions may be performed by instrumental evacuation or by medical induction. In the 15 countries for which recent data are available, medical induction is used to perform more than eight percent of all abortions in only Scotland (14 percent), where a large number of second-trimester procedures are performed, and Finland (16 percent). Physicians in several countries—Canada, Denmark, England and Wales, New Zealand, Norway, Singapore, the United States and West Germany—reduced their reliance on medical induction by as much as 80 percent over the most recent five years for which data are available (1982 to 1987 for most countries). In Norway, for example, the proportion of abortions performed by medical induction fell from 2.1 percent to 0.4 percent. Even after 16 weeks' gestation, sharp curettage is sometimes used in Canada (16 percent of abortions at 17 weeks or more), Denmark (12 percent), England and Wales (44 percent of abortions at 20 weeks or more), Sweden (six percent) and the United States (61 percent of abortions at 16 weeks or later).

Abortion is occasionally performed by hysterectomy or hysterotomy, but these procedures now account for less than 0.1 percent of abortions in Czechoslovakia, Hungary, Italy, New Zealand, Norway and the United States. In other countries with recent data, uterine surgery is used in 0.1–0.3 percent of abortions in Canada, Denmark, England and Wales, Finland, France, Scotland, Singapore, Sweden and West Germany.

New compounds that block the effect of progesterone—a hormone that is needed for the successful implantation and maintenance of the embryo—are currently under development. One such compound, RU 486, is now being used to perform 25 percent of the abortions in France, and a 95 percent effectiveness rate has been reported when it is administered with a prostaglandin within 49 days of the last menstrual period and an effectiveness rate of up to 90 percent when it is administered without the prostaglandin.[43] The main complications reported are incomplete abortion, which increases sharply with gestational age, and prolonged bleeding. Advantages of this nonsurgical method are the reduced risk of damage to the uterus and the elimination of any risk associated with the use of anesthesia. From the woman's point of view, the drug affords more of a sense of control, and the abortion is similar to a spontaneous miscarriage; however, the process takes longer than a surgical abortion.

A progesterone blocker does not solve the problem of providing safe abortion in developing countries without medical facilities, since medical backup is needed when the method fails and in the relatively rare cases of continued bleeding. Even when self-administered without the prostaglandin, however, RU 486 might be safer than some forms of nonmedical and self-induced abortion.

International comparisons of the point in gestation at which abortions are performed are imperfect because of differences and uncertainties in the measure-

Table 5. Percentage distribution of abortion patients, by type of facility in which abortion was performed and length of hospital stay (in nights), according to country

Country	Non-hospital	Hospital						Total
		All	0	1	2	3	≥4	
Canada (1985)	14.5	85.5	65.8	12.9	4.5	1.3	0.9	100.0
Czechoslovakia (1987)	0.0	100.0	69.4	30.6*	u	u	u	100.0
Denmark (1987)	0.0	100.0	52.1	43.3†	u	u	4.7	100.0
England and Wales‡ (1987)	0.0	100.0	42.4	40.3	15.0	1.2	1.0	100.0
German Federal Republic (1988)	70.4	29.6	7.2	2.6	4.8	6.5	8.5	100.0
Hungary§ (1987)	0.0	100.0	0.0	81.7	14.6	1.8	1.9	100.0
Italy (1987)	66.1**	u	u	22.9	7.6	2.0	1.4	100.0
Netherlands†† (1986)	80.9	19.1	u	u	u	u	u	100.0
Norway (1987)	51.0	49.0	u	u	u	u	u	100.0
Poland‡‡ (1987)	53.8	46.2	u	u	u	u	u	100.0
Scotland (1983)	0.0	100.0	24.4	18.8	46.0	6.7	4.1	100.0
Sweden (1987)	0.0	100.0	86.7	13.3*	u	u	u	100.0
United States (1985)	86.9	13.1	10.3	2.8*	u	u	u	100.0

*Distribution is for ≥1 nights. †Distribution is for 1–3 nights.

‡Residents only. Some hospitals provide mainly abortion services and are similar to nonhospital facilities in other countries.

§Hospitals include maternity homes. **Includes hospital abortions with no overnight stay.

††Two nonhospital facilities allow patients to stay overnight, and one is located within a hospital. Data apply to residents only; almost all abortions provided to nonresidents are performed in nonhospital clinics.

‡‡Excluding unreported abortions performed in physicians' offices and nonhospital clinics. Note: u=unavailable.

ment of gestational age. Nevertheless, the data indicate significant differences among countries, as may be seen in Table 4. The proportion of abortions performed before nine weeks ranges from 23 percent in New Zealand to 85 percent in Czechoslovakia. The Czech government encourages women to have abortions as early as possible; women who have very early procedures avoid a four-day hospital stay and a fee that is charged for abortions performed beyond eight weeks.[44]

Among countries without legal restrictions on second-trimester abortions, the proportion of abortions done after 12 weeks' gestation ranges from four percent in Singapore to 15 percent in India. The relatively high proportion in India may be attributable to a scarcity of medical resources and to a disproportionate amount of data from government hospitals. The other countries with proportions larger than 10 percent—Canada, England and Wales, and Scotland—have approval procedures that cause delays, although this is no longer the case in Canada. In addition, women in Great Britain are often delayed by the National Health Service, which has difficulty meeting the demand for abortion services in some areas.

Fewer than five percent of abortions take place beyond 12 weeks' gestation in the countries that have restrictive gestational requirements. Some of the women from these countries who need later abortions travel to England and Wales (which provided 7,400 abortions past 12 weeks to foreign women in 1987) and the Netherlands (which provided 5,100 in 1986). Few abortions are performed after 20 weeks even in countries that have no specific restrictions on later abortions; the proportions of these late abortions range from a high of 0.9 percent among residents of England and Wales to a low of 0.1 percent in Czechoslovakia and Norway (not shown).

Overall, the proportion of abortions performed in the second trimester remained relatively stable in the most recent five years for which data are available. The proportion increased by 2.7 percentage points in New Zealand, by 0.7 percentage points in Japan and by 0.6 points in Finland. Declines of more than a percentage point occurred in Canada (1.6 points) and in England and Wales (1.3), the two areas (excluding India, for which the statistics are unreliable) that have the highest proportion of second-trimester abortions.

In all the countries for which age data are available, women younger than 20 have later abortions than do older women, and slightly more women over 40 experience delays than do women aged 35–39. Low levels of educational attainment are also associated with delays in obtaining abortions. Another reason that late second-trimester abortions are performed is suspicion or identification of a fetal defect late in pregnancy. A study in England and Wales found that in 1981–1982, 19 percent of abortions done at or after 20 weeks' gestation were performed for this reason.[45]

Surgical sterilization may be performed concurrently with an abortion. There is no agreement on whether complication rates for abortion and sterilization performed concurrently are greater than the aggregate risks from two separate procedures,[46] but the risk is generally believed to be greater than the risk associated with either procedure done alone. Among the 10 countries with available data, the one with the highest proportion of abortions with concurrent sterilization is India (29 percent according to official statistics). Among developed countries, the proportion ranges from seven percent in Canada to 1.4 percent in the United States. Although no statistical data are available for Central and Eastern Europe, concurrent sterilization is known to be rare or nonexistent in those areas. The proportion of concurrent procedures has been decreasing in seven of the 10 countries; the exceptions are Finland, India and Sweden.

Serious postoperative complications are rare when abortions are performed in medical settings. For this reason, few extensive studies of complications have been published in recent years. The most comprehensive large-scale investigations of medical complications of legal abortions were undertaken in the United States by the Joint Program for the Study of Abortion. The last of these studies, undertaken from 1975 to 1978, found that 0.7 percent of abortions were associated with major complications (pelvic infection with fever of at least 38° C for three or more days, hemorrhage requiring blood transfusion and unintended major surgery).[47] The risk of developing complications was found to be strongly associated with gestational age.

Other studies have used different definitions of complications, which along with differences in medical practices and systems of care, make it difficult or impossible to compare the absolute level of complications that were found. A recent study in Denmark reported that six percent of abortion patients had complications requiring hospitalization.[48] Statistics kept by the National Abortion Federation on 68,828 abortions performed in U.S. clinics in 1988 show that 0.5 percent had complications that required hospitalization.[49]

Although direct comparisons between countries are risky because of differences in the definition and measurement of complications, the data show consistently lower complication rates for earlier abortions. Rates reported in four countries (Canada, Denmark, England and Wales, and West Germany) and New York State ranged from 0.4–3.4 percent for first-trimester abortions and from 1.1–8.7 percent for those in the second trimester. All of these areas experienced declines in complication rates in recent years, probably because of improved methods and the increasing technical skill of providers.

Adverse psychological sequelae to abortion have been studied by a WHO panel, which concluded that "there is now a substantial body of data, reported from many countries after careful and objective follow-up, suggesting frequent psychological benefit and a low incidence of adverse psychological sequelae."[50] A Danish study that compared women who had had abortions with those who had given birth found an increased rate of admissions to psychiatric hospitals among the separated, divorced and widowed women who had had abortions but not among the single and married women who had done so.[51] Studies based on the most appropriate comparison—that between abortion patients and women giving birth after being unable to terminate an unwanted pregnancy—have not been attempted to date.

The possibility that induced abortion might impair future reproductive capacity has been a concern, but no new evidence has emerged in recent years to change earlier conclusions that any adverse effects of terminating a first pregnancy by suction curettage are at most quite small.[52]

Provision of Abortion Services

Abortions performed by instrumental evacuation may be provided safely in both hospital and nonhospital facilities.[53] Nevertheless, countries differ widely in their policies and practices regarding the settings in which abortions are performed, and for hospital abortions, the average length of stay. Among the countries for which data are available, the United States relies the least on hospitals, with 87 percent of abortions performed in nonhospital facilities in 1985 (Table 5, page 83); this includes the 60 percent that were done in specialized abortion clinics. On average, abortion clinics in the United States perform 2,400 procedures a year; the largest have an annual caseload of over 10,000. The proportion of abortions performed in nonhospital facilities in the Netherlands (81 percent) is almost as high as that in the United States. Further, a majority of abortions are also provided outside of hospitals in West Germany (70 percent), Poland (54 percent, not including unreported abortions performed in physicians' offices) and Norway (51 percent).

At the other extreme are countries with laws or regulations requiring abortions to be performed only in hospitals. These countries include Czechoslovakia, Denmark, England and Wales, Hungary and Scotland, as well as Bulgaria,[f] East Germany, Finland, France, New Zealand and Romania; the latter countries are not shown in Table 5 because of lack of information on the number of nights patients spend in the hospital. Bulgaria and Hungary have regulations specifying that abortion patients spend at least one night in the hospital, although physicians in Bulgaria may waive the rule in many cases. Although a hospital restriction existed in Canada until 1988, clinic abortions were provided in the province of Quebec, where the law was not enforced, and in Toronto, where the law was being challenged in court.

In some of the countries with in-hospital requirements, the term "hospital" is broadly interpreted to include facilities that closely resemble clinics. In England and France, for example, abortions are permitted in private facilities that resemble clinics in the United States. On the other hand, two of the abortion clinics in the Netherlands are like hospitals in that they have facilities for patients to stay overnight if necessary.

Nonhospital abortions have increased over time in all the countries where they are permitted. The most dramatic change has occurred in West Germany, where the proportion of abortions performed outside of hospitals rose from 15 percent in 1977 to 70 percent in 1988. In the United States, the proportion of nonhospital abortions went from 78 percent to 87 percent between 1980 and 1985. Increases have also been documented in Poland and are estimated to have occurred in the Netherlands.

A major advantage of nonhospital abortions is lower cost. In addition, the staffs of high-volume services, whether inside or outside of hospitals, have the technical skills and understanding of the needs of abortion patients that come from extensive experience. However, specialized abortion services may result in more fragmented follow-up care than would be the case when the woman's personal physician provides the abortion.[54]

For abortions performed in hospitals, large differences exist in the proportion of patients who stay overnight and in the number of days they remain in the hospital. In the United States in 1985, 79 percent of abortions performed in hospitals were outpatient procedures. Of all U.S. abortion patients, only about three percent stayed overnight in a hospital (excluding patients hospitalized for complications). Sweden and Canada also have relatively low rates of overnight hospitalization—13 percent and 20 percent, respectively. In England and Wales, 58 percent of abortions involve overnight hospitalization, and the corresponding proportion in Scotland is 76 percent. As mentioned earlier, all abortion patients in Bulgaria and Hungary are admitted for at least 24 hours, although some Bulgarian women leave early. In West Germany, 15 percent of abortions involve a hospital stay of three or more nights.

In all countries that have reliable data, there has been a trend over the most recent five years for which data were available toward much shorter hospital stays. For example, in England and Wales, the proportion of abortions involving an overnight stay decreased from 71 percent to 58 percent between 1982 and 1987, and in West Germany, the proportion of women staying three or more nights fell from 31 percent to 15 percent between 1983 and 1988. The principal reason for this trend is probably increased confidence among physicians and medical authorities that extended hospital care is usually unnecessary. However, other explanations may be the high cost of hospitalization, the declining use of instillation and the inconvenience to the patient of a hospital stay.

In most countries, abortion services are paid for by the same insurance or payment mechanism as other medical care. In 17 developed countries with populations of more than 300,000, abortion services are available without charge under national

Table 6. Percentage distribution of legal abortions, abortion rate and abortion ratio, by woman's age, according to country

Measure	≤19				20–24	25–29	30–34	35–39	≥40	Total
	All	≤14	15–17	18–19						
% distribution										
Australia (1988)	19.1	u	u	u	28.1	23.3	16.8	9.4	3.3	100.0
Bulgaria (1987)	7.8	u	u	u	25.2	28.2	21.8	13.1	4.0	100.0
Canada (1987)	22.3	0.6	9.3	12.3	31.7	22.4	13.9	7.4	2.2	100.0
Czechoslovakia (1987)	7.7	0.0	2.4	5.3	23.5	24.3	23.4	15.5	5.5	100.0
Denmark (1988)	14.1	0.2	5.5	8.3	29.1	22.5	16.2	11.8	6.4	100.0
England and Wales* (1987)	24.9	0.6	11.1	13.2	31.5	20.0	12.1	8.1	3.3	100.0
Finland (1987)	18.9	0.2	7.0	11.7	26.6	17.3	14.3	13.3	9.6	100.0
France† (1986)	10.3	0.1	3.6	6.5	23.9	23.8	20.7	15.3	6.0	100.0
German Dem. Rep. (1976)	13.5	0.1	6.4	7.0	20.5	19.2	19.4	19.9	7.5	100.0
German Fed. Rep. (1988)	7.5	0.1	2.5	4.9	24.0	25.5	20.1	15.5	7.4	100.0
Hungary (1987)	11.0	0.1	4.2	6.6	16.7	18.8	24.5	19.8	9.2	100.0
India (FY1986)	5.1	u	u	u	26.0	33.0	23.2	10.2	2.6	100.0
Italy (1987)	7.5	0.1	2.0	5.4	20.5	22.5	21.7	18.3	9.6	100.0
Japan (1987)	5.5	u	u	u	16.3	17.4	23.7	26.4	10.6	100.0
Netherlands* (1986)	13.7	0.3	5.6	7.8	25.4	22.0	19.1	14.0	5.7	100.0
New Zealand (1988)	22.2	0.5	9.6	12.0	29.3	23.7	14.4	8.0	2.4	100.0
Norway (1987)	23.3	u	u	u	30.1	18.2	14.0	9.8	4.6	100.0
Scotland‡ (1987)	28.1	u	u	u	31.9	18.6	11.6	7.2	2.7	100.0
Singapore (1987)	8.6	u	u	u	26.7	27.7	21.2	12.0	3.8	100.0
Sweden (1987)	17.1	0.4	7.1	9.5	26.9	19.3	15.4	13.8	7.5	100.0
Tunisia (1978)	2.5	u	u	u	16.5	25.2	25.3	20.0	10.5	100.0
United States (1985)	26.2	1.1	10.4	14.7	34.5	21.2	11.4	5.4	1.3	100.0
Rate§										
Australia (1988)	18.5	u	u	u	26.5	22.1	16.4	9.7	3.8	16.6
Canada (1987)	15.2	1.2	10.6	21.0	18.5	12.0	7.8	4.6	1.6	10.2
Czechoslovakia (1987)	22.5	0.3	11.4	40.4	68.4	73.1	60.2	39.4	16.3	46.7
Denmark (1987)	15.7	0.8	9.6	23.9	29.9	24.8	18.8	13.5	6.8	18.3
England and Wales* (1987)	20.9	1.4	15.9	26.8	23.8	16.4	11.3	7.2	3.0	14.2
Finland (1987)	15.4	0.4	9.9	22.4	19.0	12.2	9.5	8.2	7.0	11.7
German Dem. Rep. (1976)	16.9	0.4	12.8	23.0	26.2	31.3	31.3	24.4	11.4	23.3
Hungary (1987)	26.1	0.9	16.8	39.1	45.0	46.6	46.5	41.3	22.1	38.2
Italy** (1987)	6.4	u	u	u	16.4	20.2	21.3	17.7	10.1	15.3
Japan** (1987)	5.8	u	u	u	19.8	22.4	28.9	24.3	11.7	18.6
Netherlands* (1986)	4.2	0.2	2.0	5.9	7.4	6.7	6.2	4.4	2.2	5.3
New Zealand (1987)	13.2	0.9	9.6	18.0	18.3	14.9	10.1	5.5	2.6	11.4
Norway (1987)	22.1	u	u	u	29.0	18.3	14.2	10.2	4.9	16.8
Scotland‡ (1987)	14.0	u	u	u	14.9	9.5	6.7	4.2	1.6	9.0
Singapore (1987)	16.7	u	u	u	43.1	40.8	33.8	22.6	10.9	30.1
Sweden (1987)	21.5	1.4	15.1	29.4	31.2	24.6	19.0	15.6	8.2	19.8
Tunisia (1977)	1.2	u	u	u	12.9	26.6	36.0	30.9	15.8	17.2
United States (1985)	45.7	4.8	30.7	63.0	52.3	30.9	17.8	9.7	2.9	28.0
Ratio††										
Australia (1988)	40.4	u	u	u	22.6	13.2	16.0	27.4	52.0	20.4
Bulgaria (1987)	25.6	u	u	u	38.0	58.2	74.6	84.7	90.6	50.7
Canada (1987)	33.4	42.7	38.2	29.7	16.8	8.8	10.3	19.9	39.8	14.7
Czechoslovakia (1987)	26.1	43.0	32.4	23.6	27.5	43.3	63.2	78.9	91.7	42.2
Denmark (1987)	50.7	83.2	67.1	43.2	27.4	16.9	23.0	44.0	74.4	27.0
England and Wales* (1987)	34.6	62.9	40.9	29.5	19.0	11.6	13.4	24.7	44.2	18.6
Finland (1986)	44.9	76.5	58.0	38.4	19.3	8.6	12.7	25.1	58.1	18.0
German Dem. Rep. (1975)	18.8	33.1	23.6	15.9	17.5	35.9	59.8	76.5	88.3	29.7
Hungary (1987)	30.7	26.6	34.3	28.6	23.3	32.1	54.6	77.8	91.2	40.2
Netherlands* (1986)	28.2	55.2	40.7	22.2	9.7	4.7	7.5	21.6	42.9	9.0
New Zealand (1987)	24.9	38.4	28.1	22.0	13.8	9.2	10.9	20.6	42.9	13.6
Norway (1987)	47.1	u	u	u	22.3	12.2	16.7	34.2	61.0	22.2
Scotland‡ (1987)	26.0	u	u	u	13.2	7.4	9.5	20.0	39.3	13.2
Singapore (1987)	57.8	u	u	u	38.0	24.2	28.2	45.5	73.1	32.7
Sweden (1986)	52.3	87.5	70.3	42.7	24.2	14.8	18.3	35.8	67.1	24.9
United States (1985)	42.1	45.7	43.2	41.0	31.5	22.0	21.8	32.2	49.4	29.7

*Residents only.

†Age attained during the year. By this measure, women are counted as one-half year older on average than when age is measured in completed years at time of abortion. For example, adjustment to age in completed years would increase the percentage of abortions obtained by women under age 20 in France in 1984 from 11.2 percent to 13.5 percent.

‡Including residents of Scotland who obtained abortions in England and Wales.

§For women under age 15, rate is computed per 1,000 women aged 13–14; for those under 20, rate is computed per 1,000 women 15–19; for 40 or more, rate is computed per 1,000 40–44.

**True rates are higher because many abortions are unreported.

††Ratio of abortions per 100 known pregnancies (defined as legal abortions plus live births, both adjusted to age of woman at time of conception). For the United States and the German Democratic Republic, live births six months later were used to match times of conception for pregnancies ending in birth and pregnancies ending in abortion; data needed for this adjustment were unavailable for other countries.

Note: u=unavailable.

Table 7. Percentage distribution of women who obtain legal abortions, by marital status, according to country

Country	Currently married	Previously married	Never-married	Total
Bulgaria*,† (1987)	78.3	21.7	u	100.0
Canada‡,§ (1987)	24.5	8.2	67.3	100.0
Czechoslovakia†,§ (1987)	77.6	7.9	14.4	100.0
Denmark† (1987)	33.6	7.4	59.0	100.0
England and Wales‡,** (1987)	24.8	9.8	65.4	100.0
Finland† (1987)	32.5	9.3	58.1	100.0
France‡ (1986)	42.2	9.2	48.6	100.0
German Federal Republic† (1988)	48.4	6.0	45.7	100.0
Hungary† (1987)	68.1	10.7	21.2	100.0
India‡ (1972–1975)	92.8	1.3	5.9	100.0
Italy‡ (1987)	67.6	3.5	28.9	100.0
Netherlands†,** (1986)	34.4	9.3	56.2	100.0
New Zealand‡ (1988)	27.7	13.2	59.1	100.0
Norway‡,§ (1987)	39.1	6.6	54.3	100.0
Scotland‡ (1987)	23.0	11.6	65.4	100.0
Singapore‡ (1987)	68.7	2.5	28.8	100.0
Sweden‡,†† (1974)	35.8	10.5	53.7	100.0
United States*,‡ (1985)	16.7	83.3	u	100.0

*Never-married included with previously married.

†Separated women are included with currently married.

‡Separated women are included with previously married.

§Women in informal unions are included with currently married.

**Residents only.

††Reporting by marital status was discontinued in 1975.

Note: u=unavailable.

health insurance systems.[*] In a few of these countries, however, some women prefer to pay for private services. For example, the large majority of abortions in Spain and Greece are paid for privately. In England and Wales and in Poland, abortions obtained in private facilities are also common. Eleven countries require nominal payments from abortion patients,[†] although in most, no fee is charged for abortions needed for certain medical or other indications. One country, Austria, covers abortions through national health insurance only if they are medically necessary.

The United States is the only developed country where the health insurance programs mandated or funded by the national government exclude coverage for medically necessary abortions other than those needed to save the woman's life. However, 13 state governments do pay for abortion services for poor women—two less than did so in 1986.

In developing countries, legal abortions are usually provided in government health facilities in the same way as are other health services. Examples of such countries are Bangladesh (for menstrual regulations), China, India, Tunisia and Vietnam. Where abortion is legally restricted but nevertheless available from physicians, as in most of Latin America, women must pay privately for the service.

Demographic Characteristics

The incidence of abortion and the ratio of abortions to births vary between subgroups in a population for several reasons, most notably because of differing rates of and reactions to unintended pregnancy and differential access to legal abortion services. Although many unintended pregnancies are carried to term, the incidence of abortion can be used to identify the subgroups within a population with the greatest problem of unintended pregnancy and thus the greatest need for improved contraceptive services. Two of the most common groups who utilize abortion are unmarried women who wish to delay the birth of their first child and married women with children who want to space additional children or end childbearing.

Abortion is frequently used to delay childbearing in English-speaking developed countries (Australia, Canada, England and Wales, New Zealand, Scotland and the United States), where abortion is concentrated among young women. More than 50 percent of abortions are obtained by women younger than 25 in all of these countries except Australia, where the proportion is 47 percent (Table 6, page 85). The rate of abortion per 1,000 women peaks at ages 18–19 in Canada, England and Wales, and the United States (and probably also in Australia and Scotland, where data on subgroups of teenagers are unavailable). This is true also for Finland. In the remaining English-speaking and Scandinavian countries and in the Netherlands, the peak occurs at ages 20–24.

In Bulgaria, Czechoslovakia, Hungary, Japan and Tunisia, where fewer than one-third of abortions are obtained by women younger than 25 and 17–37 percent are obtained by women 35 and older, abortion is used predominantly for spacing and ending childbirth. In Central and Eastern Europe, young unmarried women often become pregnant but they commonly marry and carry the pregnancy to term. In Japan and Tunisia, premarital pregnancy is probably rare, so abortion to delay initial childbearing is also relatively rare. A relatively low contraceptive prevalence rate and limited use of sterilization in Bulgaria, Czechoslovakia, Hungary and Tunisia results in increased abortion among older, married women. Older married women are also the most frequent utilizers of abortion in Japan, where the pill has not been approved for contraceptive use and sterilization is also uncommon.

Over the most recent five-year period for which data are available, most countries experienced few changes in abortion patterns by age-group. In New Zealand, the abortion rate among teenagers was stable while that of other age-groups increased sharply. The rate among teenagers also declined in relation to that of other women in Canada, Denmark, Finland and Hungary. There has been a distinct decline in the abortion rate among women aged 35 and older in relation to the total abortion rate in seven of the countries that have data (Denmark, England and Wales, Finland, Norway, Scotland, Singapore and Sweden). In Norway, for example, the rate among women 40 and over fell 26 percent in five years, while the total abortion rate increased nine percent. The increasing use of surgical sterilization undoubtedly contributed to the decline in some countries.

As Table 6 shows, the abortion ratio (the proportion of known pregnancies that end in abortion) is typically high among teenagers, falls to a low point at ages 25–29 and then increases with age to a high point among women 40 and older. Bulgaria and Czechoslovakia are exceptions in that women 19 and younger are less likely to terminate pregnancies by abortion than are older women. The United States is also unusual in that women aged 30–34 are no more likely to terminate pregnancies than women aged 25–29. In all countries, women 40 and older end a sizable proportion of their pregnancies, but the range varies from 39 percent in Scotland to 92 percent in Czechoslovakia.

As Table 7 indicates, 60 percent or more of women having abortions are unmarried in the United States (83 percent), the other English-speaking developed countries, the Netherlands (66 percent) and Scandinavia. In France and West Germany, slightly lower proportions of abortions occur among unmarried women (58 percent and 52 percent, respectively). In the remaining countries for which data are available, more than two-thirds of the women who obtain abortions are married.

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[*] Canada, Cyprus, Czechoslovakia, Denmark, East Germany, England and Wales, Greece, Italy, Luxembourg, the Netherlands, New Zealand, Norway, Poland, Portugal, Scotland, Spain and West Germany.

[†] Australia, Bulgaria, Finland, France, Hungary, Japan, Romania, the Soviet Union, Switzerland, Sweden and Yugoslavia.

The percentage of abortions obtained by unmarried women has been increasing in many countries. The increase was evident between 1982 and 1985 even in the United States, where the proportion was already high. This trend may be caused by an increasing desire among young people to delay marriage and childbearing and by increasing levels of marital dissolution. The percentage of abortions obtained by unmarried women has remained relatively stable in recent years only in Canada, Finland and New Zealand.

In India and Singapore, the two developing countries for which there are data, abortion is most commonly used by married women who want no more children or who want to space their children. This pattern is probably typical of Asian countries. A higher proportion of abortions in Africa is obtained by unmarried students, but the proportion is probably still less than half.[55] For Latin America, as well, the pattern probably falls somewhere between those in Asia and Europe.

The pattern of abortion utilization according to parity resembles that of marital status (Table 8). In English-speaking developed countries and in Finland, the Netherlands and Norway, 50–60 percent of women having abortions are childless. The proportion is almost as high in Denmark, West Germany and Sweden (46–48 percent). Among Western European countries, Italy has a uniquely low proportion of abortions obtained by childless women (29 percent). In contrast, fewer than one-fifth of women having abortions in Bulgaria, Czechoslovakia and Hungary have no children. In India and Tunisia, just 11 percent and seven percent, respectively, of abortion patients have had no children, but in Singapore, 41 percent are childless.

The proportion of abortions that are obtained by women who are childless has increased in most countries in recent years; Canada, Finland, Hungary, New Zealand and the United States are exceptions. During the 1970s, the proportion obtained by women with three or more children fell rapidly in almost all countries with data. In recent years, this proportion has continued to fall slowly in all countries except for Canada, Hungary and New Zealand, where the proportion has stabilized.

The abortion ratio dips for women with one child in all the countries shown in Table 8 except for Czechoslovakia and Hungary, where the ratio is lowest for women without children. The ratio of pregnancies that end in abortion is greater at parity two than at parity one, and in all countries except for the United States, it is greater among women who have had three children than among those who have had two. The ratio declines, however, after parity three in Canada, Czechoslovakia, Denmark, Hungary, Sweden and the United States, and after parity four in the remaining countries. This lower ratio reflects a concentration of higher parity women who avoid abortion for religious or other reasons and women who desire large families. In most countries, the abortion ratio has increased in recent years at parities zero and one and decreased among women who have four children or more.

The question of repeat abortion is detailed in Table 9 (page 88), which shows that among industrialized countries, the proportion of abortions obtained by women who have had one or more prior induced abortions ranges from 17 percent in New Zealand to 49 percent in Hungary. In general, the proportion of all legal abortions that are repeat procedures is highest in countries that have high abortion rates.

In all countries, the proportion of abortions that are repeat legal procedures rose rapidly after legalization, because the proportion of women who had had a first legal abortion increased, and these women were at risk of another unintended pregnancy. This proportion continued to increase in the most recent five-year period for which data are available. Hungary is an exception because abortion has been legal long enough (since 1956) to allow the proportion of women who have had a first abortion to reach an equilibrium. Actually, the proportion of repeat abortions has fallen in that country because the overall abortion rate dropped sharply from 91 per

Table 8. Percentage distribution of women who obtain legal abortions and abortion ratio per 100 known pregnancies, by parity, according to country

Measure and country	Parity						
	0	1	2	3	4	≥5	Total
% distribution							
Bulgaria* (1987)	16.1	83.9†	u	u	u	u	100.0
Canada‡ (1987)	58.4	19.9	15.2	4.9	1.2	0.4	100.0
Czechoslovakia* (1987)	12.4	19.9	47.8	15.8	2.9	1.1	100.0
Denmark§ (1987)	47.7	19.2	23.3	7.5	1.5	0.7	100.0
England and Wales**,†† (1987)	59.7	14.3	16.0	6.7	2.2	1.1	100.0
Finland‡ (1987)	50.1	17.0	20.5	9.3	2.5	0.6	100.0
German Fed. Rep.§ (1988)	47.4	20.3	20.9	7.5	2.4	1.4	100.0
Hungary§ (1987)	18.9	19.4	41.4	14.3	3.7	2.3	100.0
India* (1972–1975)	11.1	13.6	22.4	20.9	32.0‡‡	u	100.0
Italy‡ (1987)	28.9	19.6	31.7	13.1	6.7‡‡	u	100.0
Netherlands*,**,§§ (1986)	56.1	14.9	18.1	7.3	3.6‡‡	u	100.0
New Zealand§ (1987)	52.7	15.9	16.4	9.2	3.7	2.2	100.0
Norway§ (1987)	53.4	17.4	27.1*†	u	2.2‡‡	u	100.0
Scotland* (1987)	58.0	15.7	16.7	6.6	2.0	0.9	100.0
Singapore* (1987)	40.6	16.3	27.6	11.2	3.0	1.3	100.0
Sweden‡ (1987)	45.5	17.5	23.4	10.4	2.5	0.8	100.0
Tunisia* (1978)	7.1	10.4	15.2	14.7	16.9	35.7	100.0
United States§ (198[illegible])	54.9	22.0	15.1	5.4	1.7	1.0	100.0
Ratio							
Canada‡ (1987)	18.9	8.7	15.1	16.5	14.6	8.1	14.7
Czechoslovakia* (1987)	16.9	28.3	73.3	75.7	63.9	45.4	42.2
Denmark§ (1987)	27.3	16.5	40.7	47.2	40.9	38.1	27.0
England and Wales**,†† (1979)	18.7	6.3	20.0	28.0	31.2	23.8	18.6
Finland‡ (1986)	21.9	9.5	21.3	28.3	29.6	8.7	18.0
Hungary§ (1987)	22.4	25.9	69.6	72.5	64.2	52.4	40.2
Netherlands*,**,§§ (1986)	11.2	3.9	11.4*†	u	13.8‡‡	u	9.0
Norway§ (1987)	26.0	12.3	28.3*†	u	u	u	22.2
Singapore* (1987)	30.9	16.1	43.5	57.8	59.5	50.8	32.7
Sweden‡ (1986)	25.5	14.2	31.3	41.0	37.9	31.3	24.9
United States§ (1985)	35.8	21.9	28.8	28.1	25.2	20.0	29.7

*Surviving children. †Includes all parities. ‡Prior deliveries.

§Prior live births. **Residents only. ††Prior live births and stillbirths. ‡‡Includes parities of ≥4.

§§Based on clinic abortions; it is assumed that parity of women having abortions in hospitals is similar to those having clinic abortions.

*†Includes parities 2–3. *‡Includes parities ≥2. Note: u=unavailable.

Table 9. Percentage distribution of legal abortions, by number of prior induced abortions, according to country

Country	No. of prior abortions				
	0	1	2	≥3	Total
Canada (1987)	78.0	17.4	3.6	1.1	100.0
Czechoslovakia (1987)	57.8	27.9	10.3	4.1	100.0
Denmark (1987)	62.0	25.3	8.4	4.3	100.0
England and Wales* (1987)	82.3	17.7†	u	u	100.0
Finland (1987)	74.4	19.9	4.2	1.5	100.0
France (1986)	81.0	15.3	2.8	0.9	100.0
Hungary (1987)	51.1	27.8	12.0	9.0	100.0
India‡ (1975–1977)	93.5	5.8	0.7§	u	100.0
Italy (1987)	70.0	20.4	6.2	3.5	100.0
Netherlands*,** (1986)	78.4	17.2	3.2	1.2	100.0
New Zealand (1987)	82.6	14.6	2.4	0.5	100.0
Norway (1987)	73.2	21.0	5.8§	u	100.0
Singapore (1987)	58.2	28.3	9.2	4.3	100.0
Sweden (1987)	65.3	24.4	7.2	3.1	100.0
United States (1985)	59.5	26.2	9.4	5.0	100.0

*Residents only. †Includes ≥1 prior abortions.

‡From Indian Council for Medical Research, Collaborative Study on Short Term Sequelae of Induced Abortion, New Delhi, 1981.

§Includes ≥2 prior abortions. **Clinic abortions only. Note: u=unavailable.

1,000 women of reproductive age in 1969 to the current rate of 38 per 1,000. In most other countries, if abortion rates do not change significantly, the proportion of abortions that are repeat procedures should stabilize in a few years.

Discussion

Except in the United States, the trend in developed countries toward liberalization of abortion laws that began in the 1950s has continued, although at a slower rate in recent years. Aside from the possibility of a relaxation of the restrictive law in Belgium, little additional in the way of dramatic change can be expected.

Abortion rates in developed countries have been relatively stable in recent years. Some encouraging changes have occurred, however, such as a decline among women aged 35 and older, probably as a result of increased surgical sterilization and better contraceptive use. In a few countries, there have been decreases in the rates among teenagers in relation to those of other age-groups. A lurking question, however, is whether concern about AIDS will affect abortion rates either by encouraging contraceptive use or, conversely, by causing couples to switch to condoms from more effective methods.

In Scandinavia and English-speaking countries, especially the United States, the most important prerequisite for reducing unintended pregnancy and abortion is an improvement in contraceptive use among young, unmarried women. In most Central and Eastern European countries and probably the Soviet Union, on the other hand, the greatest need is to provide contraceptive services and supplies and encourage their use among married women with children.

The continued improvement in the safety of abortion in developed countries is encouraging. Mortality is down to an average level of 0.6 deaths per 100,000 legal abortions, and declines are apparent in complication rates as well. The improved safety record is in part attributable to the development and refinement of suction curettage, which has almost completely replaced the more difficult and hazardous sharp curettage for first trimester procedures in most developed countries. However, sharp curettage still predominates in some developed countries, where medical practitioners need training in suction curettage and equipment to do vacuum aspiration procedures. Similarly, sharp curettage has partially replaced instillation for second-trimester abortions, but there are still many instillation procedures in circumstances when curettage might be safer and less stressful for the woman.

At the same time that the safety of abortion has improved, the use of overnight hospitalization has been reduced. Outpatient care requires fewer medical resources and is preferred by many patients. In view of the positive results in areas where outpatient care is the norm, most countries can be expected to continue to reduce hospital stays. Along with the movement away from overnight hospitalization has been a shift to services outside of hospitals altogether. In the United States, 87 percent of abortions, including most of those in the second trimester, are now performed in clinics and doctors' offices. While hospitals may afford better integration of abortion services with other medical care, in some situations nonhospital clinics offer compensating advantages: lower costs, a staff that is more experienced and sympathetic in serving abortion patients, insulation of abortion patients from other obstetric and gynecology patients and from hospital staff hostile to abortion, easier access for women who cannot or prefer not to obtain abortions from their personal physicians and more timely service than in hospitals, where abortions must compete with other procedures for operating room time. Clinics are likely to continue to replace hospitals as the primary providers of abortion services in areas without legal barriers to their establishment.

A number of factors are working toward greater acceptance of abortion in developing areas: an increasing desire of women and couples to control their fertility, a greater concern with women's roles and rights and population pressures. While eventual relaxation of legal restrictions appears probable, the timing is difficult to predict. Some countries may revise their abortion laws in response to increased awareness of the adverse public health effects of illegal abortion.[56] Others will undoubtedly follow the examples of Greece, the Netherlands, Turkey and other countries that liberalized their laws only after abortion had long been widely practiced.

Changes in abortion rates are difficult to measure in developing areas, and patterns depend on the circumstances of the particular country. Probably typical of the long-term trend is South Korea, where the abortion rate increased sharply as fertility fell but has recently fallen back in response to more universal contraceptive use. In China, as well, the abortion rate is now significantly lower than its high point in 1983. As a country begins to reduce its fertility, it is common for the abortion rate to increase at the same time that contraceptive use increases. Eventually, contraceptive use becomes sufficiently widespread to cause the abortion rate to fall, but many developing countries have yet to reach this point.

Much needs to be done to improve the safety of abortion in developing areas. Where abortion and menstrual regulation are permitted, as in India and Bangladesh, physicians and other medical personnel are being trained in the procedures, but safe services are still not available to most women. Where abortion is restricted, clandestine procedures may be increasingly performed by physicians, as in some parts of Latin America, but outdated abortion methods are often used. Legal restrictions make it difficult to train physicians; in addition, public services are usually not provided, and poor women are unable to pay the fees of private physicians.

An improvement in safety and a reduction in medical care costs can be made with a relatively small investment in suction equipment and training. Where electricity is unavailable or where more sophisticated equipment is too expensive, a simple hand syringe can be used for very early abortions. The same equipment and training are useful for treating incomplete spontaneous abortions and illegally induced abortions and are, therefore, appropriate where abortion is legally restricted. Although progress is being made, greater awareness of the negative health consequences of unsafe abortions would speed the process.

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Rising Prevalence of Cohabitation in United States May Have Partially Offset Decline in Marriage Rates

Levels of cohabitation among unmarried couples are so high that they substantially offset declining marriage rates, according to data from the National Survey of Families and Households (NSFH).[1] However, most cohabitation is very short-lived; two out of five such relationships are disrupted within one year. Furthermore, unions formed by cohabitation, including marriages preceded by cohabitation, are much more likely to dissolve than unions formed by marriage. Cohabitation rates are highest among women, whites, persons who did not complete high school and those from welfare-receiving or single-parent families.

Between March 1987 and May 1988, the NSFH interviewed a total of 13,017 randomly selected adults (19 and over). When appropriate, a questionnaire was completed by the interviewee's spouse or cohabiting partner. Some subgroups, such as cohabiting couples, single-parent families, stepfamilies, newlyweds, blacks and Hispanics, were oversampled. Interview questions emphasized cohabitation and the links between cohabitation and marriage. The final sample consisted of 6,881 married couples and 682 cohabiting couples; of these, 5,648 spouses and 519 cohabiting partners completed questionnaires.

Four percent of all respondents were currently cohabiting at the time of the survey; 11 percent of those who had never married and 10 percent of those who were previously married were cohabiting. Never-married persons aged 25–34 and separated or divorced persons younger than 30 had the highest rates of cohabitation (16–17 percent and 26–28 percent, respectively). Seventeen percent of currently married respondents said they had cohabited before their first marriage. Twenty-five percent of respondents said they had cohabited at some time in their lives; 28 percent of never-married respondents and 32 percent of previously married respondents had cohabited at some time. By their mid-30s, almost half of those surveyed had cohabited at some point; among the separated or divorced, this proportion was two-thirds.

The proportion of persons who cohabited before their first marriage has quadrupled since 1965, from 11 percent for those who were in marriages begun in 1965–1974 to 44 percent for those who were in marriages begun in 1980–1984. If this trend is continuing, the investigators note, the proportion is probably well over half for marriages begun in the late 1980s. None of those from the 1965–1974 marriage cohort had cohabited with anyone but their spouse; in contrast, five percent of those in the 1980–1984 marriage cohort had lived with someone other than their spouse. Even higher cohabitation rates are found among the previously married: Thirty-four percent of those marrying for the second time in 1965–1974 had cohabited either with their spouse or with someone else prior to marriage, compared with 60 percent of second marriages begun in 1980–1987.

Life-table data show that the proportion of women cohabiting before age 25 increased from three percent among those born in 1940–1944 to 37 percent among those born in 1960–1964, but the proportion married by this age fell from 82 percent to 61 percent over the same period. Thus, despite the decline in marriage, there was only a drop of seven percentage points in the proportion ever in a union. It appears that while the marriage rate is decreasing, the cohabitation rate is filling in much of the gap.

Despite the prevalence of cohabitation, however, most of these unions are very brief. Life-table estimates for unions beginning in 1975–1984 show that the median length of cohabitation is 1.3 years. One-quarter of couples who live together marry within a year, and half marry within three years. However, 57 percent of first cohabitations (including those resulting in marriage) dissolve after 10 years, compared with 30 percent of first marriages. Contrary to assumptions that cohabiting with a future spouse might lead to a stronger marriage, 36 percent of married couples who live together before marrying separate or divorce within 10 years, compared with 27 percent of those who do not live together prior to marriage. The investigators stress that this high separation rate is not so much a consequence of cohabitation as it is a reflection of less traditional attitudes on the part of the cohabitors.

A proportional hazards multivariate analysis used data from respondents 45 and younger, and adjusted for the effects of sex, race, age, education (of the respondent and of his or her parents), religion, welfare status and family structure while growing up. The investigators found that cohabitation rates are 14 percent lower among men than women, reflecting women's tendency to marry at a younger age. While the initial analysis showed that blacks are more likely to cohabit than non-Hispanic whites, controlling for factors such as education and family background reveals that blacks are actually 26 percent less likely to cohabit than non-Hispanic whites.

College graduates are 64 percent less likely to cohabit than are those who did not finish high school. Parents' education is positively related to cohabitation rates, perhaps because education may be positively associated with more liberal familial attitudes. People growing up in families receiving welfare are 40 percent more likely to cohabit, and those coming from single-parent families are 62 percent more likely to do so. However, cohabitation is widespread among all societal groups; for instance, more than one-quarter of college graduates cohabited before marriage.

Even though most cohabiting relationships are relatively short in length, and marriages following cohabitation are less stable, the investigators argue that the plateau in divorce rates observed since the early 1980s might partially be explained by the high levels of cohabitation preceding marriage. Many marriages that would have ended in divorce are being replaced by cohabitations that dissolve before a marriage can begin. Because of the growing prevalence of cohabitation, the investigators contend that "measures based solely on marriage and marital stability, such as official vital statistics, are increasingly misrepresenting both the timing and incidence of actual behavior patterns."—*R. Turner*

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Developing Country Pill Users Experience Small Rise in Blood Pressure

Compared with IUD users, pill users in both developed and developing countries experience a small increase in blood pressure at the end of one year of use, according to the results of a multicountry study of the effects of oral contraceptives on blood pressure.[1] However, this increase is unlikely to contribute substantially to hypertension. A companion study found no significant differences in blood pressure change between women taking pills containing 30 mcg of estrogen and those taking 50 mcg of estrogen.[2] Although most previous research has shown that the pill does induce changes in blood pressure, this work has been done primarily in developed countries, where the prevalence of cardiovascular disease and hypertension is high. Both new analyses allow researchers to evaluate the effects of the pill on blood pressure among women in developing countries, where relatively fewer women smoke and where socioeconomic factors dictate a difference in salt intake and other dietary influences.

To analyze changes in blood pressure among oral contraceptive users and IUD users, researchers working with the World Health Organization collected data from 10 centers in three developed and six developing countries.[*] Beginning in the late 1970s, new contraceptive users at each center who chose the pill as their method were randomly assigned to groups receiving one of various compositions of the pill available at that center. Because all centers distributed a pill containing 250 mcg of the progestogen levonorgestrel and 50 mcg of the estrogen ethinyl estradiol, the analysis compared women who used this particular dosage of pill with new users at each center who selected the IUD as their method of contraception. Women aged 18–34 were eligible for the study, provided they met a number of medical requirements, including regular menses, no recent use of hormonal contraceptives, blood pressure of 140/90 or less and no history of diabetes, abnormal Pap smear, liver dysfunction, thromboembolism, cerebrovascular disorder or reproductive tract malignancy.

At the initial visit, investigators took a medical and reproductive history, collected data on a number of socioeconomic variables and determined the woman's blood pressure. Subsequent visits at three-month intervals allowed investigators to update data and determine new blood pressure levels. Data from all participating centers were analyzed centrally, and any women not meeting the study criteria were excluded. Of the 1,554 women recruited into the study (770 in the pill group and 784 in the IUD group), nine percent of pill users and 10 percent of IUD users were found to be ineligible and were retrospectively excluded, leaving 704 and 703 patients, respectively, for analysis. The number of women available for analysis declined at each three-month interval, with 61 percent of pill users and 69 percent of IUD users still enrolled in the study at 12 months.

Overall, readings for both systolic and diastolic blood pressure declined by about three mmHg over the course of the study among the IUD users. Among pill users, blood pressure tended to rise initially and then remain constant or decline. As a result, the change in systolic pressure among pill users in comparison with IUD users was an increase of just under four mmHg at three months to five mmHg at 12 months. Diastolic pressure readings increased by about 2.5 mmHg over those of IUD users. The differences in change between the pill users and the IUD users were highly significant ($p<0.001$). A pill-induced change in blood pressure occurred in all 10 of the centers in the study, but the size of the increase was largest in Moscow—10.4 mmHg for systolic pressure and 6.9 mmHg for diastolic. Relatively large changes were also recorded in Manila, Singapore and Bombay, and the response was smallest in Santiago (Cuba), Havana, Bangkok and Lusaka. These differences between centers could not be explained by climate, economic development or other variables measured in the study.

Hypertension was diagnosed in four women in the pill group; no women in the IUD group developed hypertension. The cumulative life-table rate of hypertension among pill users was 0.78 per 100 woman-years of use.

A regression analysis controlling for such variables as baseline blood pressure, age, ponderal index (body weight divided by stature), history of hypertension in pregnancy, room temperature and family history of hypertension, stroke and heart disease did not explain the differences between pill and IUD users in blood pressure change. However, age and ponderal index at recruitment did predict the change in diastolic pressure, independently of pill use; the increase was associated with older age and heavier weight. However, these factors had little effect on systolic pressure change. Warmer room temperatures were associated with reductions in blood pressure.

The researchers believe they have been able to avoid a number of pitfalls in research on blood pressure and pill use by comparing changes in blood pressure rather than absolute levels of blood pressure, which may vary according to the characteristics of women who choose each method. The researchers note that most of the change in blood pressure associated with pill use—a difference of five mm at the end of one year—was already obvious at the three-month and six-month intervals.

The researchers conclude that oral contraceptives do appear to cause a small transitory increase in both systolic and diastolic blood pressure, but that "it seems unlikely that oral contraceptive use will contribute substantially to hypertension and its sequelae." They add, "While it is sound to recommend screening prior to oral contraceptive use and monitoring of blood pressure in . . . users, the absence of facilities for doing so should not create a barrier to the use of oral contraceptives."

The second study, involving many of the same centers as the first analysis, examined whether the estrogen component of the pill is responsible for the apparent increase in blood pressure among pill users. Past research has offered no clear-cut answer to this question, with some analy-

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[*] Centers in developed countries were located in Bratislava, Czechoslovakia; Ljubljana, Yugoslavia; and Moscow, USSR. Centers in developing countries were located in Bangkok, Thailand; Bombay, India; Havana and Santiago, Cuba; Lusaka, Zambia; Manila, Philippines; Santiago, Chile; and Singapore.

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ses implicating the estrogen component of the pill and some implicating the progestogen. The study comprised women in six centers* who had been randomly assigned to one of two possible pill dosage groups; both groups received pills containing 250 mcg of the progestogen levonorgestrel, but in one group the progestogen was coupled with 50 mcg of ethinyl estradiol and in the other with a 30 mcg dose. The same criteria for enrollment in the study were used as in the previous analysis, and neither the patient nor the data collector knew which pill the patient was taking.

Of the 737 patients enrolled in the study, 363 received the pill with 50 mcg of estrogen and 374 received the pill with 30 mcg. At the time the data were analyzed, six percent of the 50 mcg group and nine percent of the 30 mcg group were excluded because they did not meet the eligibility criteria. Thus, data on 680 women divided equally between the two groups were included; 65 percent of women in the high-estrogen group and 57 percent of pill users in the low-estrogen group completed all four of the follow-up visits occurring at three-month intervals following enrollment. A within-center comparison of the demographic and health characteristics of the women in the two pill groups found no significant differences, nor was there a significant difference in baseline blood pressure levels. There were, however, not unexpected differences between centers in baseline levels, which may be at least partially attributable to country variations in ponderal index.

An overall comparison and a comparison within each center of blood pressure change among women taking the higher estrogen pill versus those taking the lower estrogen dose found no significant differences between the two groups. However, because the sample sizes in each center were small (ranging from 32 to 85), confidence intervals were wide, and differences of up to three mm in measuring systolic pressure and two mm in diastolic pressure cannot be ruled out. Although the study was only of pills containing relatively low doses of estrogen, the researchers believe that their results provide some evidence against hypotheses that estrogen or the ratio of estrogen to progestogen cause pill-induced changes in blood pressure.—*J. Johnson*

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Low Rate of Weight Gain Late in Pregnancy May Signal Premature Birth

Lower than normal weight gain during the second half of pregnancy is strongly related to spontaneous delivery before 37 weeks' gestation among both teenagers and older women, according to two recent analyses. One study found that the risk of preterm birth among women who gained weight at a lower than average rate after the 20th week of pregnancy was 60 percent higher than the risk among women who gained weight at an average rate.[1] Another found that teenagers who gained insufficient weight after the 24th week of pregnancy (but who gained an adequate amount of weight overall) were 69 percent more likely to deliver prematurely than teenagers who gained at a normal rate during the same period. Among all teenagers studied, the risk of delivering an infant that was small for gestational age or of low birth weight (<2,500 g) was significantly increased by inadequate weight gain either early or late in pregnancy.[2]

The first study assessed maternal weight gain among 2,163 pregnant women who attended the Prenatal Nutrition Project at the University of California, San Diego. The mean age of the women was 24 years; 45 percent were white, 31 percent were Hispanic, 13 percent were black and 10 percent were Asian. A total of 118 women (5.5 percent) delivered prematurely (before 37 weeks' gestation). Those women and the participants who delivered at term gained weight at a similar rate up until 20 weeks' gestation; by 28 weeks, weight gain in the preterm group had fallen behind that in the at-term group, and this difference increased somewhat by 32 weeks. There were no significant differences between the groups in prepregnancy weight or in the prevalence of women in each group who were underweight, overweight, obese or of short stature.

The mean maternal weight gain during pregnancy for all the women was 14.3 kg, and the average weekly rate was 0.36 kg; women who delivered at term gained 14.5 kg, on average, and their weekly rate was 0.39 kg. However, women who delivered preterm gained an average of just 10.9 kg, and their weekly rate was 0.33 kg. Thirty-seven percent of the mothers who delivered preterm gained less than 0.27 kg each week, on average, compared with only 24 percent of those who delivered at term.

The study indicated a clear and significant relationship between the weekly rate of maternal weight gain and the risk of preterm birth: Women who gained less than 0.27 kg per week were 60 percent more likely to deliver preterm than were those whose average weight gain was 0.27–0.52 kg each week. Furthermore, the risk of preterm birth was 2.5 times higher for women with the lowest weight gain than for those with the highest weight gain (above 0.52 kg per week). These results were obtained after adjusting for other confounding variables found to be significantly associated with preterm birth, including age of less than 16 years, black ethnicity, incompetent cervix, abuse of illicit drugs or exposure to trauma, surgery or general anesthesia during pregnancy and short interpregnancy interval.

The investigators caution that their results do not prove that lower weight gain is a cause of preterm delivery; because the rate of weight gain decreases slightly in normal pregnancies as women approach term, reduced weight gain earlier in pregnancy may signal preterm delivery as well. It is possible that abnormal physiological changes may cause both lower maternal weight gain and early delivery. Although no association was found between dietary intake and delivery status, the investigators note that reliable dietary measurements are difficult to obtain. In addition, there were no data on strenuous physical activity or psychosocial stress, both of which have been linked to preterm birth in other studies.

In the second study, investigators measured the rate and amount of weight gained during pregnancy among 1,790 pregnant adolescents aged 18 or younger. They examined the effects of total maternal weight gain, early weight gain (before 24 weeks' gestation) and late weight gain (after 24 weeks) on the risk of low birth weight, preterm birth and delivery of an infant that is small for gestational age. Eighty percent of the teenagers gained an adequate amount of weight during pregnancy (a mean of 14.8 kg). However, many did not gain weight at a steady rate. For example, 17 percent of the teenagers in the study gained an insufficient amount of weight during the first 24 weeks of gestation (less than 4.3 kg), even though 62 percent of them gained an adequate total amount of weight by the time of delivery. On the other hand, 22 percent of all teenagers gained an inadequate amount of weight after 24 weeks of gestation (less than 0.40 kg per week, on average), yet 75 percent of this group gained an adequate amount of weight overall. Only eight percent of the teenagers gained insufficient weight during both pregnancy intervals.

Early and late weight gain appear to have independent effects on pregnancy outcome. After adjusting for such variables as maternal age, ethnicity, prepregnancy body mass index and smoking, the investigators observed that for all teenagers, the risk of having an infant that was small for gestational age was doubled when weight gain was below normal either in early pregnancy or throughout the pregnancy; late inadequate weight gain increased the risk by 60 percent. In contrast, after adjustment for the factors listed above and for history of preterm delivery, the risk of preterm birth did not appear to be influenced by the rate of early weight gain, although the risk was increased by 55 percent when late weight gain was inadequate and was 2.6 times higher when total weight gain was below normal. Of the three outcomes measured, low birth weight was the most strongly linked to maternal weight gain: The risk of having a low-birth-weight infant was doubled among teenagers with late inadequate weight gain, was nearly three times higher among those with early inadequate weight gain, and was more than four times higher among those who gained insufficient weight during both periods.

Teenagers with adequate total weight gain during pregnancy were analyzed separately; the results were similar: Those whose early weight gain was inadequate were 88 percent more likely to deliver an infant that was small for gestational age, but those whose late weight gain was insufficient had a 69 percent higher risk of preterm delivery; early inadequate weight gain did not increase the risk. Finally, teenagers doubled their risk of delivering a low-birth-weight infant if their overall weight gain was sufficient but if the amount gained late in pregnancy was inadequate.

Weight gain during the first and second trimester is mainly attributed to deposition and expansion of maternal tissues; during the third trimester it supports fetal and placental growth, and for this reason, supplementation programs often emphasize either total weight gain or late weight gain as a means to improve infant health. However, inadequate early weight gain also appears detrimental to the fetus, perhaps inhibiting normal growth and development of the placenta and thereby reducing the transfer of nutrients. The investigators point out that the risk of early inadequate weight gain is especially high for women in developing countries, because of chronic undernutrition. Similarly, pregnant teenagers in the United States may be poorly nourished both before and during pregnancy, and some may deliberately limit early weight gain in an attempt to hide or to deny their condition. Finally, because young teenagers themselves may still be growing, mother and fetus may be competing for nutrients. The results suggest that if prenatal care programs for adolescents do not emphasize balanced weight gain throughout pregnancy, the programs may fail to reduce the incidence of intrauterine growth retardation, even when they succeed in lowering the rates of preterm delivery.—*M. Witwer*

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Sexually Transmitted Infections Contribute to Risk Of Prenatal Growth Retardation, Preterm Delivery

Potentially treatable genital infections in pregnant women are important contributors to the incidence of intrauterine growth retardation and preterm birth. *Chlamydia trachomatis* infection is strongly associated with both adverse outcomes, infection with *Mycoplasma hominis* is a significant factor in preterm birth and infection with *Candida albicans* is an important element in intrauterine growth retardation.[1] According to the results of a prospective study of women at high risk of developing obstetric complications, mycoplasma infection can be considered associated with one-fifth of the risk of having a preterm delivery, and chlamydial infection may be responsible for nearly one-fifth of the risk of experiencing intrauterine growth retardation.

A prospective study conducted by researchers at Johns Hopkins University examined risk factors for intrauterine growth retardation (defined as birth weight below the standard 10th percentile for gestational age, adjusted for sex and race) and preterm birth (delivery before 37 weeks' gestation). The study was conducted among members of a high-risk obstetric population attending the Johns Hopkins Obstetric Clinic between November 1983 and January 1985. Women were eligible for inclusion in the study if they were aged 18 or older and were 20–30 weeks pregnant and if they had registered for prenatal care before the 26th week of their pregnancy.

The 801 participants were predominantly black (90 percent), unmarried (86 percent), young (median age of 23) and poor (56 percent with annual incomes below $7,500). Sizable proportions of these women smoked cigarettes (46 percent), used marijuana (13 percent) or consumed alcohol (38 percent) during their pregnancy. Sixteen percent tested positive for *C. trachomatis,* 38 percent were infected with *C. albicans* and 26 percent were diagnosed as infected with *M. hominis.* Thirteen percent of babies were recorded as preterm, while eight percent were diagnosed as having suffered intrauterine growth retardation.

Before adjusting for the effects of potentially confounding characteristics, the researchers observed that infection with *C. trachomatis* increased the likelihood of preterm delivery and intrauterine growth retardation by more than 50 percent, infection with *M. hominis* increased the risk of preterm delivery by over 100 percent and the presence of *C. albicans* in the maternal genital tract increased the risk of intrauterine growth retardation by 80 percent. A stepwise multiple logistic regression analysis controlling for infection with each of the three microorganisms and for maternal age and weight, cigarette smoking, alcohol consumption, marijuana use, age at first intercourse, birthweight of previous delivery, education, marital status, income, race, the baby's sex and diagnosis of cervicitis indicated that *C. trachomatis* infection increased the odds of intrauterine growth retardation by a factor of almost 2.5. Similarly, the presence of *C. albicans* infection raised the risk of growth retardation by a factor of 1.9. Furthermore, infection with *M. hominis* and *C. trachomatis* raised the odds of preterm delivery by factors of 2.0 and 1.6, respectively. The researchers also calculated models for each outcome that excluded infection with these three microorganisms; when they compared these with the above models, they found that inclusion of the infection variables in the analysis significantly increased the likelihood of both preterm birth and intrauterine growth retardation ($p<0.01$).

However, other factors also contributed to the risk of an adverse pregnancy outcome. For example, heavy maternal drinking or smoking were significantly associated with intrauterine growth retardation (by factors of 2.2 and 5.6, respectively), and heavy smoking was strongly related to the risk of preterm delivery (by a factor of 3.5). The researchers point out that of the seven variables significantly associated with either or both of the two pregnancy outcomes examined, five—cigarette smoking, alcohol intake and infection with *C. trachomatis, M. hominis* or *C. albicans*—could be reduced by medical intervention during pregnancy. The other two significant associations (between previous pregnancy outcome and preterm delivery and between low pregnancy weight and intrauterine growth retardation) are not as amenable to change. The investigators estimated that light, moderate and heavy smoking may be responsible for nine, four and five percent of the incidence of preterm delivery, respectively, and that infection with *M. hominis* and *C. trachomatis* may account for 21 percent and eight percent of this risk, respectively. Likewise, light, moderate and heavy smoking may account for 13, 22 and nine percent, respectively, of the incidence of intrauterine growth retardation, with heavy alcohol intake explaining 13 percent and infection with *C. trachomatis* and *C. albicans* responsible for 17 percent and 26 percent, respectively.

The investigators note that because smokers tend to have a lower prevalence of *C. trachomatis* infection, controlling for the effect of smoking increases the importance of *C. trachomatis* infection as a risk factor for intrauterine growth retardation; they suggest that the failure to adjust for smoking in previous studies may have masked the full effect of *C. trachomatis* infection during pregnancy. The researchers warn that the attributable risks calculated for each of the infections should be interpreted with caution, since "causal relations between *M. hominis, C. trachomatis* or *C. albicans* and adverse pregnancy outcome have not been established." Until carefully designed studies have confirmed causality, the authors do not recommend routine screening for these infections during pregnancy, at least for the sole purpose of preventing potential adverse outcomes.—*L. Remez*

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Subgroups of U.S. Women Differ Widely in Exposure To Sexual Intercourse

More than four out of five American women aged 15–44 have had sexual intercourse, and about three-quarters have had intercourse in the preceding three months, according to an analysis designed to evaluate associations between sexual behavior and a woman's risk of contracting a sexually transmitted disease (STD).[1] Unpublished data from the 1982 National Survey of Family Growth (NSFG) show that adolescents were substantially less likely to have been sexually active very recently than were older women, and a sizable proportion of sexually experienced adolescents had abstained in the month preceding the survey. Moreover, only one-quarter of nonwhite female teenagers and around one in seven white female teenagers had had intercourse regularly over the year before the survey.

The risk of contracting STDs is greatly affected by one's sexual behavior, but most studies of sexual behavior (particularly those involving young people) have examined only whether or not a person reports ever having had sexual intercourse. To gain a better understanding of the variability of sexual behavior, researchers used data from Cycle III of the NSFG to calculate the proportion of female respondents who had ever had intercourse (i.e., were sexually experienced), who had had intercourse in the three months preceding the survey, who had had intercourse in the month before the survey and who had had intercourse in each of the preceding 12 months (i.e., were consistently sexually active).

Eighty-six percent of white respondents and 88 percent of nonwhite respondents were sexually experienced. Among whites, this proportion rose from 45 percent among 15–19-year-olds and 85 percent among 20–24-year-olds to about 98 percent among those 30 and older; among nonwhites, the proportion who had ever had intercourse rose from 56 percent of 15–19-year-olds to 90 percent of 20–24-year-olds and 97–100 percent of those 30 and older. Whites aged 15–19 and 20–24 were significantly less likely than comparable nonwhites to have ever had sexual intercourse.

A somewhat smaller proportion of women had had intercourse in the preceding three months (77 percent of whites and 78 percent of blacks), including 39 percent of white adolescents and 50 percent of black adolescents; the latter difference was statistically significant. A total of 70–71 percent of the respondents had had intercourse in the month preceding the survey, but only 57–59 percent had been consistently sexually active during the year before the survey.

Recent and consistent sexual activity was less common among adolescents and young adults. For example, just 39 percent of black teenagers had been sexually active in the preceding month, and only 25 percent had had intercourse in each of the 12 months before the survey. Likewise, only 28 percent of white teenagers had been sexually active in the preceding month, and just 15 percent had been consistently sexually active. Among 20–24-year-olds, 48 percent of blacks and 49 percent of whites had been consistently sexually active in the preceding year.

The investigators also found that substantial proportions of sexually active young women had not had intercourse within a month of the survey. For example, 38 percent of white adolescents and 31 percent of black adolescents who had ever had intercourse had not done so in the preceding month, including 44 percent and 35 percent of 15–17-year-olds and 34 percent and 28 percent of 18–19-year-olds, respectively. However, these proportions fell drastically among older respondents: Among whites, the proportion of "experienced abstainers" was only 12 percent of 25–29-year-olds, and among blacks, it was just 17 percent. The researchers observe that "the largest change in sexual activity among American women occurs between the teenage years and the late 20s. Both the accumulation of sexual experience and [recent] sexual activity rise markedly from ages 15–19 to ages 25–29."

According to the investigators, relying only on measures of sexual experience gives a misleading perspective on sexual activity and, as a result, on the degree of STD risk. Teenagers and nonwhite women have been shown to be at greater risk of contracting STDs, yet adolescents are both less sexually experienced and less consistently sexually active than are older women; in addition, for all age-groups except teenagers, nonwhite women are less sexually experienced and less consistently sexually active than are white women. Thus, that nonwhite women have a greater risk of contracting STDs probably indicates that they engage in higher risk sexual activity (e.g., having a greater number of sexual partners or having intercourse with infected partners). —*M. Klitsch*

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Teenagers' Condom Use Affected by Peer Factors, Not by Health Concerns

Convenience and social considerations may have more of an impact on teenagers' intention to use condoms than does knowledge of the practical health benefits of condom use.[1] The vast majority of a group of male and female adolescents visiting a clinic knew that condoms helped prevent pregnancy and protect against sexually transmitted diseases (STDs), but the factors most strongly related to their intention to use condoms during the next year were the beliefs that condoms are easy to use, that they permit one to engage in sexual intercourse spontaneously and that they are popular with adolescents' peers. In addition, regardless of gender, the respondents who intended to use condoms believed it important for the young man to share in the responsibility for contraceptive use.

Between February 1984 and September 1985, questionnaires were distributed to male and female 14–19-year-olds attending a pair of adolescent health care clinics in San Francisco (one at a university medical center and one at Kaiser Permanente). To be eligible, participants had to be English-speaking, single and not pregnant and have no serious developmental or psychosocial problems. In all, 345 female adolescents and 161 male adolescents were sampled; their mean ages were 16.7 and 16.2. Thirty-five percent were non-Hispanic whites, 33 percent were black, 13 percent were Hispanic, 10 percent were Asian and eight percent were of some other ethnic background or did not answer. Six percent of the participants were in seventh or eighth grade, 35 percent were in ninth or 10th grade, 42 percent were in 11th or 12th grade, 12 percent were high school graduates (with 10 percent in college or junior college) and five percent either had dropped out or gave no information about their education.

Overall, 68 percent of the young women and 57 percent of the young men reported that they had ever had intercourse. Fifty-nine percent of the sexually active females and 63 percent of the sexually active males had used condoms at some time. The teenagers were asked how likely or unlikely it was that each of a series of statements about condom use was true, based on a seven-point scale ranging from very unlikely (–3) to very likely (3). They were also asked how likely they thought it was that they would use a condom at some time in the next year.

Overall, 87 percent of the female respondents and 93 percent of the males believed that condoms are popular with their peers, and 80 percent and 82 percent reported that they are easy to use. Ninety-three percent of the males and 77 percent of the females also credited condoms with protecting against STDs. Sixty-nine percent of the young women endorsed the idea that condom use emphasizes the partner's need to exert self-control, and 93 percent of the young men viewed the fact that the condom makes the male responsible for contraception as a positive aspect of condom use. In addition, large majorities (82 percent of the males and 66 percent of the females) believed that the condom allows intercourse to be more spontaneous. Fifty-eight percent of the young men disagreed with the idea that condom use is painful or uncomfortable.

To determine the factors that influenced the teenagers' opinions about condoms and their intention to use them, the researchers used a multivariate regression analysis to control for the effects of past sexual activity, past condom use and racial or ethnic background. They found that five beliefs were significantly and positively associated with the young women's intention to use condoms—that condoms allow one to have sex spontaneously, that condoms are easy to use, that condoms are popular with peers, that condom use requires self-control on the part of the partner and that condoms are clean. In addition, one belief—that condoms are inconvenient—was negatively associated with their intention to use condoms.

Among the males, only four beliefs were positively associated with their intention to use condoms, and three of them—that condoms allow one to have sex spontaneously, that condoms are easy to use and that condoms are popular with peers—were also significant among the females. In addition, the consideration that condoms make the male partner responsible for contraception was significantly and positively associated with the young men's intention to use them. The belief that condom use is painful or uncomfortable was negatively associated with the young men's intention to use condoms at some time in the next year.

Thus, neither the belief that condoms help prevent STDs nor the belief that condoms effectively prevent against pregnancy was significantly associated with the young men's or young women's intention to use them; the factors that were related were more short-term, social considerations. The researchers observe that the items emphasizing the importance of the young man's taking responsibility in condom use were also significant for both sexes. The researchers conclude, then, that family planning providers need to emphasize the social and physical aspects of condom use; "health considerations do not appear to be a salient dimension of the adolescents' choice to use or not use condoms."—*M. Klitsch*

Reference

1. S. M. Kegeles, N. E. Adler and C. E. Irwin, Jr., "Adolescents and Condoms: Associations of Beliefs with Intentions to Use," *American Journal of Diseases of Children*, 143:911, 1989.

Chances of Survival Are Low When Preterm Baby Weighs Less than 750 g

Only about one in five infants born weighing less than 750 g survive. Moreover, according to a recent study, approximately one-third of survivors suffer from moderate to severe neurodevelopmental impairments.[1] Despite recent increases in cesarean delivery and delivery room resuscitation, mortality and morbidity among these infants have not declined; aggressive medical interventions appear to delay rather than prevent death, decreasing the number of stillbirths while increasing neonatal mortality.

The study population comprised live-

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born infants* with birth weights of less than 750 g and those with gestational ages of less than 28 weeks, regardless of birth weight, delivered at Cleveland's MacDonald Hospital for Women between July 1982 and June 1988. Gestational age was estimated from the date of the mother's last menstrual period and confirmed both by obstetric measures, when possible, and by clinical assessment of the infant. All infants with gestational ages of at least 20 weeks were included in the study.

Data on births occurring between July 1982 and June 1985 were compared with data on births occurring between July 1985 and June 1988 to determine whether demographic, perinatal or treatment variables had changed over the course of the study. During the first period, 98 infants were born weighing under 750 g, and 20 percent survived; over the second period, 129 such infants were born, of whom 18 percent survived. There was no significant difference between the two groups in mean birth weight or gestational age; however, the proportion of infants who weighed under 500 g at birth was higher in the second period than in the first period (31 percent vs. 21 percent). There was no difference between the two periods in the number or the survival rate of infants transferred to the neonatal intensive care unit, and there was little difference in infant characteristics such as race, sex and frequency of multiple birth and growth retardation.

The cesarean section rate was higher in the second period than in the first period (19 percent vs. 12 percent), as was the proportion of surviving infants who were delivered by that procedure (48 percent vs. 30 percent). There was little difference between the first period and the second period in the gestational age (27.1 weeks vs. 26.8 weeks) or weight (580 g vs. 640 g) of those infants at delivery. In both periods, the most frequently cited reason for cesarean delivery was severe intrauterine growth failure. The proportion of infants who were intubated and given respiratory support was higher during the second period than during the first period (47 percent vs. 38 percent).

There were no consistent differences between the two periods when rates of cesarean delivery, endotracheal intubation and survival were compared according to birth weight subgroups. However, the proportion of infants born weighing more than 500 g who were intubated and placed on mechanical ventilation increased from 44 percent in the first period to 63 percent in the second period. The use of resuscitation and intubation fell with decreasing birth weight: Ninety percent of infants who weighed 700–749 g at birth were intubated, compared with 12 percent of infants weighing less than 500 g at birth. Overall, however, survival rates fell with birth weight, regardless of medical intervention: Sixty-six percent of infants with birth weights of 700–749 g survived, compared with 35 percent of those with birth weights of 600–699 g and 16 percent of those with birth weights under 600 g. During the entire study period, only one infant weighing less than 500 g at birth (439 g at 27 weeks of gestation) survived.

Over the six years of the study, 396 infants were born at less than 28 weeks of gestation. Of 35 born at less than 22 weeks of gestation, only one survived, and of 117 born at 22–24 weeks of gestation, just 12 (10 percent) survived. At 25–27 weeks of gestation, the survival rate increased sharply, with 153 of 244 infants surviving (63 percent). The survival rate for the latter group increased from 52 percent to 71 percent between the two periods.

The primary cause of mortality among infants who died in the delivery area during both periods was immaturity, and about one-third of them had concurrent amniotic-fluid infection syndrome. The mean time until death was 1.6 hours. Among infants who died after transfer to the neonatal intensive care unit, the most frequent cause of death during the first period was respiratory distress syndrome or its sequelae (50 percent), followed by immaturity (23 percent) and infection (18 percent); during the second period, respiratory distress syndrome accounted for 73 percent of deaths, followed by infection and intraabdominal hemorrhage (10 percent each). The mean age at death among these infants increased from 73 hours during the first period to 880 hours during the second period. Follow-up revealed that two of the children born during the first period had died after discharge, one at 11 months and one at 27 months, and that one child born during the second period had died at nine months. There was no difference between the two periods in neonatal morbidity, such as bronchopulmonary dysplasia (a chronic lung disease), blood infection and retinal problems caused by prematurity.

The neurologic development of surviving infants was assessed at eight months and at 20 months (except for those born between July 1987 and June 1988, who were assessed only at eight months). At 20 months, four of 18 survivors born during the first period (22 percent) and seven of 14 survivors born during the second period (50 percent) had moderate to severe neurodevelopmental impairments, including legal blindness, developmental delay and cerebral palsy. In addition, two of eight infants assessed only at eight months had cerebral palsy.

The investigators observe that the number of infants weighing less than 750 g who were born alive rose by 30 percent between the two periods, probably reflecting more referrals of high-risk patients in the second trimester of pregnancy and a change in the definition of live birth that moved infants from the stillbirth to the live-birth category. They note, however, that although the use of cesarean section and delivery room resuscitation increased over the course of the study period, there was no corresponding rise in survival. (The survival rate of infants born at a gestational age of 25–27 weeks rose, but this group included infants with birth weights up to 1,250 g.) According to the investigators, in some instances the use of intubation and mechanical ventilation simply increased the infants' age at death and shifted the primary cause of death from immaturity to chronic lung disease.

The researchers also note that rates of morbidity among the survivors were high and that the incidence of neurodevelopmental impairments increased between the two periods. They conclude that although an infant "at or beyond 25 weeks of gestation or with an expected birth weight of 700 g or more has more than a 50 percent chance of survival . . . the outlook is extremely poor for infants [born at less than] 24 weeks of gestation or [those with] birth weights below 600 g." They add, however, that "the prevailing moral and medicolegal climate dictates active intervention even when the prospects for survival are minimal and those for survival without severe impairment still smaller."—*F. Althaus*

Reference

1. M. Hack and A. Fanaroff, "Outcomes of Extremely-Low-Birth-Weight Infants Between 1982 and 1988," *New England Journal of Medicine,* 321:1642, 1989.

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*A live-born infant is one who breathes or shows any other evidence of life, such as a heartbeat, pulsation of the umbilical cord or movement of the voluntary muscles.

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REFERENCES: 1. McClure DA, Edelman DA: Worldwide method effectiveness of the Today® vaginal contraceptive sponge. *Adv Contracept* 1:305-311, 1985. 2. North BB, Vorhauer BW: Use of the Today® contraceptive sponge in the United States. *Int J Fertil* 30:81-84, 1985.

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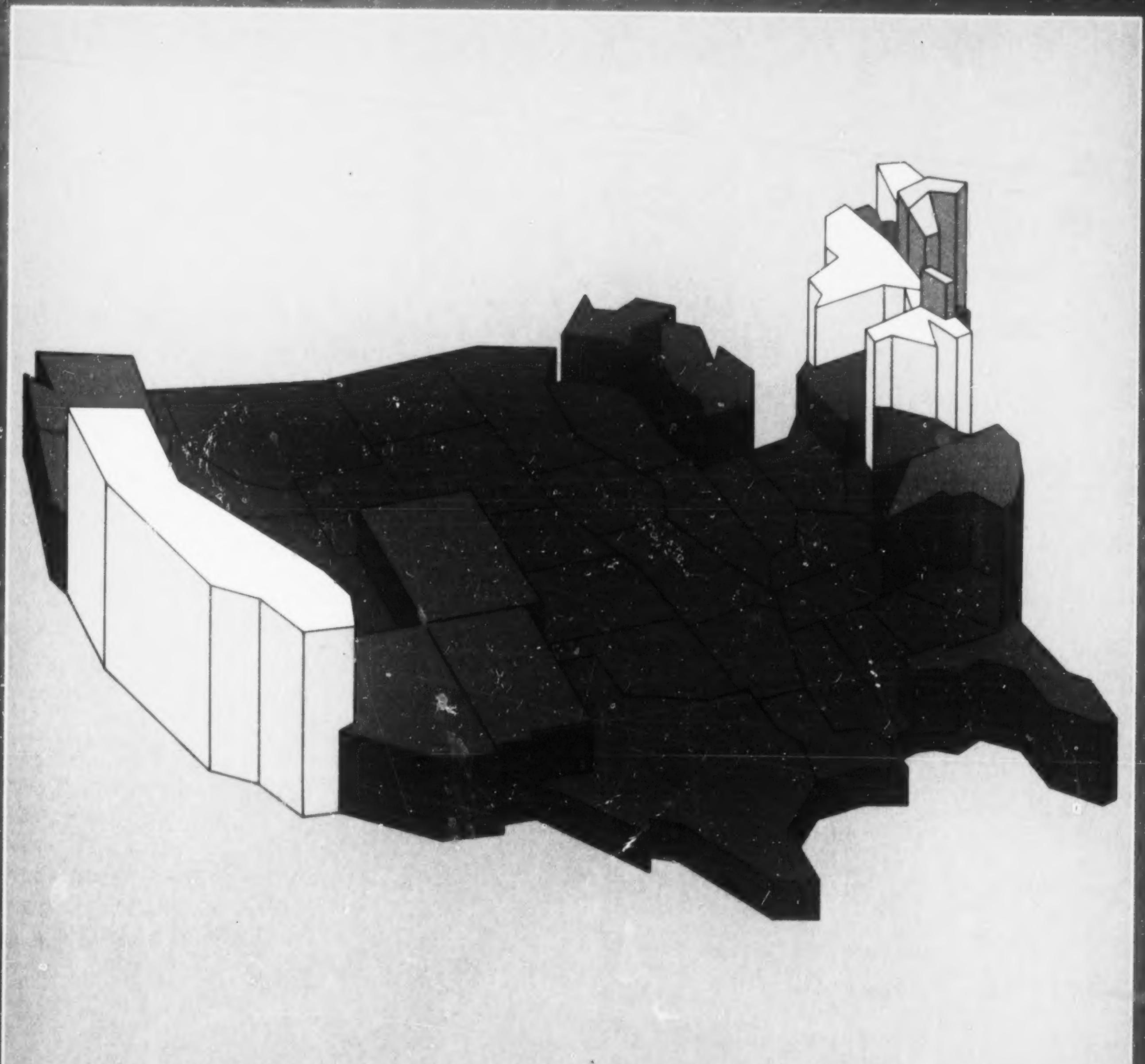
Volume 22, Number 3, May/June 1990

Family Planning Perspectives

Reproductive Health Counseling for Young Men
Family Interaction and Teenage Sexual Behavior

Abortion Services in the United States, 1987–1988



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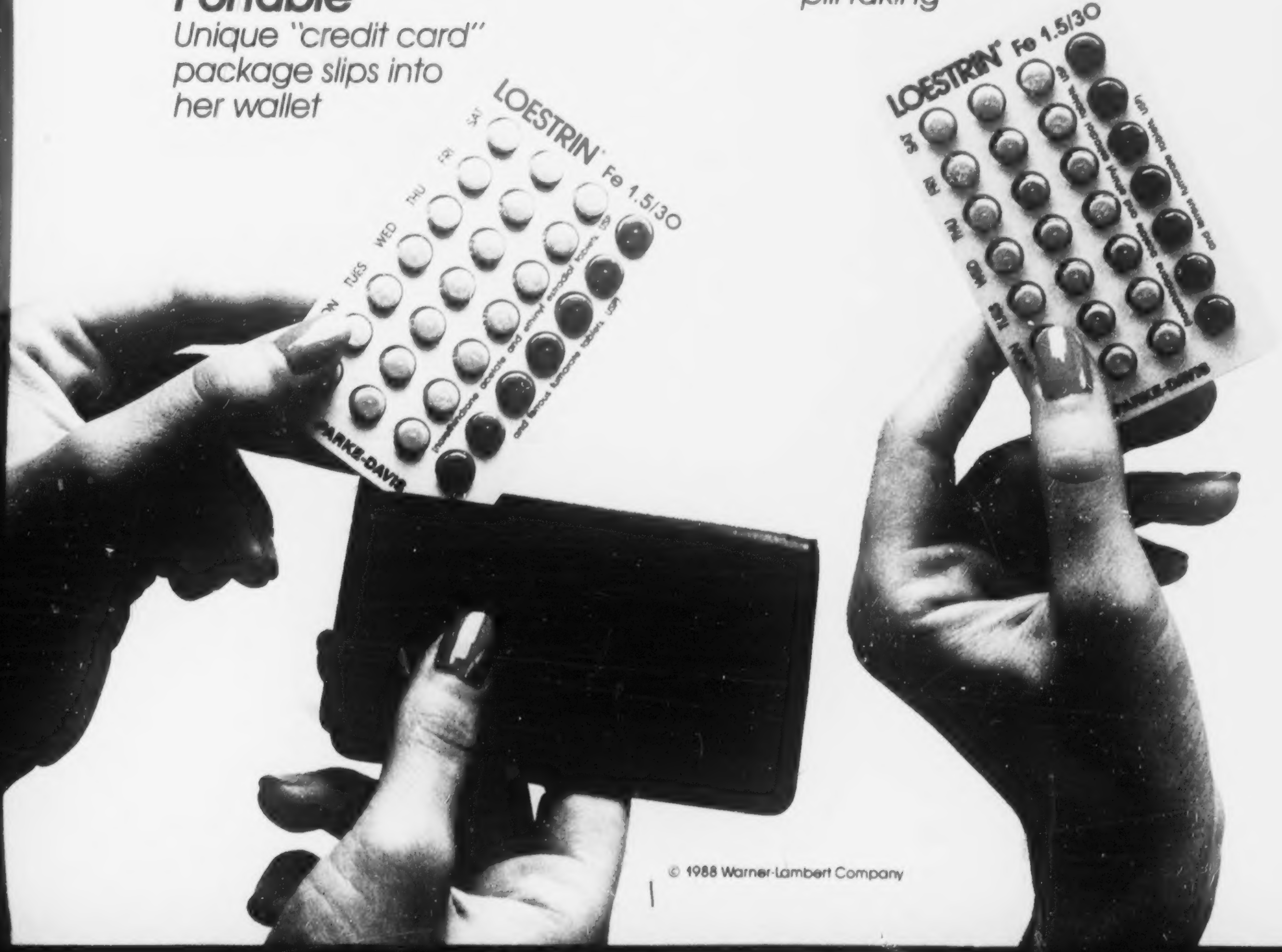

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prescribing information
on next page.

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WARNINGS

> **Cigarette smoking increases the risk of serious cardiovascular side effects from oral contraceptive use. This risk increases with age and with heavy smoking (15 or more cigarettes per day) and is quite marked in women over 35 years of age. Women who use oral contraceptives should be strongly advised not to smoke.**
>
> The use of oral contraceptives is associated with increased risk of several serious conditions including thromboembolism, stroke, myocardial infarction, hepatic adenoma, gallbladder disease, and hypertension. Practitioners prescribing oral contraceptives should be familiar with the following information relating to these risks.

1. *Thromboembolic Disorders and Other Vascular Problems.* An increased risk of thromboembolic and thrombotic disease associated with the use of OCs is well established. Three principal studies in Great Britain and three in the United States have demonstrated an increased risk of fatal and nonfatal venous thromboembolism and stroke, both hemorrhagic and thrombotic. These studies estimate that users of OCs are 4 to 11 times more likely than nonusers to develop these diseases without evident cause. **Cerebrovascular Disorders:** In a collaborative American study of cerebrovascular disorders in women with and without predisposing causes, it was estimated that the risk of hemorrhagic stroke was 2.0 times greater in users than in nonusers and the risk of thrombotic stroke was 4 to 9.5 times greater in users than in nonusers. **Myocardial Infarction:** An increased risk of myocardial infarction associated with the use of OCs has been reported, confirming a previously suspected association. These studies, conducted in the United Kingdom, found, as expected, that the greater the number of underlying risk factors for coronary artery disease (cigarette smoking, hypertension, hypercholesterolemia, obesity, diabetes, history of preeclamptic toxemia), the higher the risk of developing myocardial infarction, regardless of whether the patient was an OC user or not. OCs, however, were found to be a clear additional risk factor. In terms of relative risk, it has been estimated that OC users who do not smoke (smoking is considered a major predisposing condition to myocardial infarction) are about twice as likely to have a fatal myocardial infarction as nonusers who do not smoke. OC users who are also smokers have about a 5-fold increased risk of fatal infarction compared to users who do not smoke, but about a 10- to 12-fold increased risk compared to nonusers who do not smoke. Furthermore, the amount of smoking is also an important factor. In determining the importance of these relative risks, however, the baseline rates for various age groups must be given serious consideration. The importance of other predisposing conditions mentioned above in determining relative and absolute risks has not as yet been quantified; it is quite likely that the same synergistic action exists, but perhaps to a lesser extent. **Risk of Dose:** In an analysis of data derived from several national adverse reaction reporting systems, British investigators concluded that the risk of thromboembolism, including coronary thrombosis, is directly related to the dose of estrogen used in oral contraceptives. Preparations containing 100 mcg or more of estrogen were associated with a higher risk of thromboembolism than those containing 50 to 80 mcg of estrogen. Their analysis did suggest, however, that the quantity of estrogen may not be the sole factor involved. This finding has been confirmed in the United States. Careful epidemiological studies to determine the degree of thromboembolic risk associated with progestogen-only OCs have not been performed. Cases of thromboembolic disease have been reported in women using these products, and they should not be presumed to be free of excess risk. **Persistence of Risk:** In confirmation of earlier reports, two studies have suggested that an increased risk may persist for as long as 6 years after discontinuation of oral contraceptive use for cerebrovascular disease and 9 years for myocardial infarction. In addition, a prospective study suggested the persistence of risk for subarachnoid hemorrhage. **Estimate of Excess Mortality from Circulatory Diseases:** A large prospective study carried out in the U.K. estimated the mortality rate per 100,000 women per year from diseases of the circulatory system for users and nonusers of OCs according to age, smoking habits, and duration of use. The overall excess death rate annually from circulatory diseases for OC users was estimated to be 20 per 100,000 (ages 15 to 34 – 5/100,000; ages 35 to 44 – 33/100,000; ages 45 to 49 – 140/100,000), the risk being concentrated in older women, in those with a long duration of use, and in cigarette smokers. It was not possible, however, to examine the interrelationships of age, smoking, and duration of use, nor to compare the effects of continuous versus intermittent use. Although the study showed a 10-fold increase in death due to circulatory diseases in users for 5 or more years, all of these deaths occurred in women 35 or older. Until larger numbers of women under 35 with continuous use for 5 or more years are available, it is not possible to assess the magnitude of the relative risk for this younger age group. The available data from a variety of sources have been analyzed to estimate the risk of death associated with various methods of contraception. The estimates of risk of death for each method include the combined risk of the contraceptive method (eg, thromboembolic and thrombotic disease in the case of oral contraceptives) plus the risk attributable to pregnancy or abortion in the event of method failure. This latter risk varies with the effectiveness of the contraceptive method. The study concluded that the mortality associated with all methods of birth control is low and below that associated with childbirth, with the exception of OCs in women over 40 who smoke. (The rates given for pill only/smokers for each age group are for smokers as a class. For "heavy" smokers [more than 15 cigarettes a day] the rates given would be about double; for "light" smokers [less than 15 cigarettes a day] about 50 percent.) The lowest mortality is associated with the condom or diaphragm backed up by early abortion. The risk of thromboembolic and thrombotic disease associated with OCs increases with age after approximately age 30 and, for myocardial infarction, is further increased by hypertension, hypercholesterolemia, obesity, diabetes, or history of preeclamptic toxemia and especially by cigarette smoking. The physician and the patient should be alert to the earliest manifestations of thromboembolic and thrombotic disorders (eg, thrombophlebitis, pulmonary embolism, cerebrovascular insufficiency, coronary occlusion, retinal thrombosis, and mesenteric thrombosis). Should any of these occur or be suspected, the drug should be discontinued immediately. A four- to six-fold increased risk of postsurgery thromboembolic complications has been reported in OC users. If feasible, OCs should be discontinued at least 4 weeks before surgery of a type associated with an increased risk of thromboembolism or prolonged immobilization. 2. *Ocular Lesions.* There have been reports of neuro-ocular lesions, such as optic neuritis or retinal thrombosis, associated with the use of OCs. Discontinue OC medication if there is unexplained, sudden or gradual, partial or complete loss of vision; onset of proptosis or diplopia; papilledema; or retinal vascular lesions, and institute appropriate diagnostic and therapeutic measures. 3. *Carcinoma.* Long-term continuous administration of either natural or synthetic estrogen in certain animal species increases the frequency of carcinoma of the breast, cervix, vagina, and liver. Certain synthetic progestogens, none currently contained in OCs, have been noted to increase the incidence of mammary nodules, benign and malignant, in dogs. In humans, three case control studies have reported an increased risk of endometrial carcinoma associated with the prolonged use of exogenous estrogen in postmenopausal women. One publication reported on the first 21 cases submitted by physicians to a registry of cases of adenocarcinoma of the endometrium in women under 40 on OCs. Of the cases found in women without predisposing risk factors for adenocarcinoma of the endometrium (eg, irregular bleeding at the time OCs were first given, polycystic ovaries), nearly all occurred in women who had used a sequential OC. These products are no longer marketed. No evidence has been reported suggesting an increased risk of endometrial cancer in users of conventional-combination or progestogen-only OCs. Several studies have found no increase in breast cancer in women taking OCs or estrogens. One study, however, while also noting no overall increased risk of breast cancer in women treated with OCs, found an excess risk in the subgroups of OC users with documented benign breast disease. A reduced occurrence of benign breast tumors in users of OCs has been well-documented. In summary, there is at present no confirmed evidence from human studies of an increased risk of cancer associated with OCs. Close clinical surveillance of all women taking OCs is, nevertheless, essential. In all cases of undiagnosed persistent or recurrent abnormal vaginal bleeding, appropriate diagnostic measures should be taken to rule out malignancy. Women with a strong family history of breast cancer or who have breast nodules, fibrocystic disease, or abnormal mammograms should be monitored with particular care if they elect to use OCs instead of other methods of contraception. 4. *Hepatic Tumors.* Benign hepatic adenomas have been found to be associated with the use of OCs. One study showed that OC formulations with high hormonal potency were associated with a higher risk than lower potency formulations. Although benign, hepatic adenomas may rupture and may cause death through intra-abdominal hemorrhage. This has been reported in short-term as well as long-term users of OCs. Two studies relate risk with duration of use of the contraceptive, the risk being much greater after 4 or more years of OC use. While hepatic adenoma is a rare lesion, it should be considered in women presenting abdominal pain and tenderness, abdominal mass or shock. A few cases of hepatocellular carcinoma have been reported in women taking oral contraceptives. The relationship of these drugs to this type of malignancy is not known at this time. 5. *Use in or Immediately Preceding Pregnancy, Birth Defects in Offspring, and Malignancy in Female Offspring.* The use of female sex hormones – both estrogenic and progestational agents – during early pregnancy may seriously damage the offspring. It has been shown that females exposed *in utero* to diethylstilbestrol, a nonsteroidal estrogen, have an increased risk of developing in later life a form of vaginal or cervical cancer that is ordinarily extremely rare. This risk has been estimated to be of the order of 1 in 1,000 exposures or less. Although there is no evidence at the present time that OCs further enhance the risk of developing this type of malignancy, such patients should be monitored with particular care if they elect to use OCs instead of other methods of contraception. Furthermore, a high percentage of such exposed women (from 30% to 90%) have been found to have epithelial changes of the vagina and cervix. Although these changes are histologically benign, it is not known whether this condition is a precursor of vaginal malignancy. Male children so exposed may develop abnormalities of the urogenital tract. Although similar data are not available with the use of other estrogens, it cannot be presumed that they would not induce similar changes. An increased risk of congenital anomalies, including heart defects and limb defects, has been reported with the use of sex hormones, including OCs, in pregnancy. One case control study has estimated a 4.7-fold increase in risk of limb-reduction defects in infants exposed *in utero* to sex hormones (OCs, hormonal withdrawal tests for pregnancy or attempted treatment for threatened abortion). Some of these exposures were very short and involved only a few days of treatment. The data suggest that the risk of limb-reduction defects in exposed fetuses is somewhat less than 1 in 1,000 live births. In the past, female sex hormones have been used during pregnancy in an attempt to treat threatened or habitual abortion. There is considerable evidence that estrogens are ineffective for these indications, and there is no evidence from well-controlled studies that progestogens are effective for these uses. There is some evidence that triploidy and possibly other types of polyploidy are increased among abortuses from women who become pregnant soon after ceasing OCs. Embryos with these anomalies are virtually always aborted spontaneously. Whether there is an overall increase in spontaneous abortion of pregnancies conceived soon after stopping OCs is unknown. It is recommended that for any patient who has missed two consecutive periods, pregnancy should be ruled out before continuing the contraceptive regimen. If the patient has not adhered to the prescribed schedule, the possibility of pregnancy should be considered at the time of the first missed period, and further use of OCs should be withheld until pregnancy has been ruled out. If pregnancy is confirmed, the patient should be apprised of the potential risks to the fetus and the advisability of continuation of the pregnancy should be discussed in the light of these risks. It is also recommended that women who discontinue oral contraceptives with the intent of becoming pregnant use an alternate form of contraception for a period of time before attempting to conceive. Many clinicians recommend 3 months although no precise information is available on which to base this recommendation. The administration of progestogen-only or progestogen-estrogen combinations to induce withdrawal bleeding should not be used as a test of pregnancy. 6. *Gallbladder Disease.* Studies report an increased risk of surgically confirmed gallbladder disease in users of OCs and estrogens. In one study, an increased risk appeared after 2 years of use and doubled after 4 or 5 years of use. In one of the other studies, an increased risk was apparent between 6 and 12 months of use. 7. *Carbohydrate and Lipid Metabolic Effects.* A decrease in glucose tolerance has been observed in a significant percentage of patients on OCs. For this reason, prediabetic and diabetic patients should be carefully observed while receiving OCs. An increase in triglycerides and total phospholipids has been observed in patients receiving OCs. The clinical significance of this finding remains to be defined. 8. *Elevated Blood Pressure.* An increase in blood pressure has been reported in patients receiving OCs. In some women, hypertension may occur within a few months of beginning OC use. In the first year of use, the prevalence of women with hypertension is low in users and may be no higher than that of a comparable group of nonusers. The prevalence in users increases, however, with longer exposure, and in the fifth year of use is two and a half to three times the reported prevalence in the first year. Age is also strongly correlated with the development of hypertension in OC users. Women who previously have had hypertension during pregnancy may be more likely to develop elevation of blood pressure when given OCs. Hypertension that develops as a result of taking OCs usually returns to normal after discontinuing the drug. 9. *Headache.* The onset or exacerbation of migraine or development of headache of a new pattern which is recurrent, persistent, or severe, requires discontinuation of OCs and evaluation of the cause. 10. *Bleeding Irregularities.* Breakthrough bleeding, spotting and amenorrhea are frequent reasons for patients discontinuing OCs. In breakthrough bleeding, as in all cases of irregular bleeding from the vagina, nonfunctional causes should be borne in mind. In undiagnosed persistent or recurrent abnormal bleeding from the vagina, adequate diagnostic measures are indicated to rule out pregnancy or malignancy. If pathology has been excluded, time or a change to another formulation may solve the problem. Changing to an OC with a higher estrogen content, while potentially useful in minimizing menstrual irregularity, should be done only if necessary since this may increase the risk of thromboembolic disease. Women with a past history of oligomenorrhea or secondary amenorrhea or young women without regular cycles may have a tendency to remain anovulatory or to become amenorrheic after discontinuation of OCs. Women with these preexisting problems should be advised of this possibility and encouraged to use other contraceptive methods. Post-use anovulation, possibly prolonged, may also occur in women without previous irregularities. 11. *Ectopic Pregnancy.* Ectopic as well as intrauterine pregnancy may occur in contraceptive failures. However, in progestogen-only OC failures, the ratio of ectopic to intrauterine pregnancies is higher than in women who are not receiving OCs, since the drugs are more effective in preventing intrauterine than ectopic pregnancies. 12. *Breast-Feeding.* OCs given in the postpartum period may interfere with lactation. There may be a decrease in the quantity and quality of the breast milk. Furthermore, a small fraction of the hormonal agents in OCs has been identified in the milk of mothers receiving these drugs. The effects, if any, on the breast-fed child have not been determined. If feasible, the use of OCs should be deferred until the infant has been weaned. **PRECAUTIONS: General:** 1. A complete medical and family history should be taken prior to the initiation of OCs. The pretreatment and periodic physical examinations should include special reference to blood pressure, breasts, abdomen and pelvic organs, including Papanicolaou smear and relevant laboratory tests. As a general rule, OCs should not be prescribed for longer than 1 year without another physical examination being performed. 2. Under the influence of estrogen-progestogen preparations preexisting uterine leiomyomata may increase in size. 3. Patients with a history of psychic depression should be carefully observed and the drug discontinued if depression recurs to a serious degree. Patients becoming significantly depressed while taking OCs should stop the medication and use an alternate method of contraception in an attempt to determine whether the symptom is drug related. 4. OCs may cause some degree of fluid retention. They should be prescribed with caution, and only with careful monitoring, in patients with conditions which might be aggravated by fluid retention, such as convulsive disorders, migraine syndrome, asthma, or cardiac or renal insufficiency. 5. Patients with a past history of jaundice during pregnancy have an increased risk of recurrence of jaundice while receiving OC therapy. If jaundice develops in any patient receiving such drugs, the medication should be discontinued. 6. Steroid hormones may be poorly metabolized in patients with impaired liver function and should be administered with caution in such patients. 7. OC users may have disturbances in normal tryptophan metabolism which may result in a relative pyridoxine deficiency. The clinical significance of this is yet to be determined. 8. Serum folate levels may be depressed by OC therapy. Since the pregnant woman is predisposed to the development of folate deficiency and the incidence of folate deficiency increases with increasing gestation, it is possible that if a woman becomes pregnant shortly after stopping OCs, she may have a greater chance of developing folate deficiency and complications attributed to this deficiency. 9. The pathologist should be advised of OC therapy when relevant specimens are submitted. 10. Certain endocrine and liver function tests and blood components may be affected by estrogen-containing OCs: a. Increased sulfobromophthalein retention; b. Increased prothrombin and factors VII, VIII, IX, and X; decreased antithrombin 3; increased norepinephrine-induced platelet aggregability; c. Increased thyroid binding globulin (TBG) leading to increased circulating total thyroid hormone, as measured by protein bound iodine (PBI), T4 by column, or T4 by radioimmunoassay. Free T3 resin uptake is decreased, reflecting the elevated TBG; free T4 concentration is unaltered; d. Decreased pregnanediol excretion; e. Reduced response to metyrapone test. **INFORMATION FOR THE PATIENT:** See Patient Labeling. **DRUG INTERACTIONS:** Reduced efficacy and increased incidence of breakthrough bleeding have been associated with concomitant use of rifampin. A similar association has been suggested with barbiturates, phenylbutazone, phenytoin sodium, tetracycline, and ampicillin. **CARCINOGENESIS, PREGNANCY, NURSING MOTHERS:** See Contraindications and Warnings sections. **ADVERSE REACTIONS:** An increased risk of the following serious adverse reactions has been associated with the use of OCs (see Warnings): Thrombophlebitis; pulmonary embolism; coronary thrombosis; cerebral thrombosis; cerebral hemorrhage; hypertension; gallbladder disease; benign hepatomas; congenital anomalies. There is evidence of an association between the following conditions and the use of OCs, although additional confirmatory studies are needed: Mesenteric thrombosis; neuro-ocular lesions, eg, retinal thrombosis and optic neuritis. The following adverse reactions have been reported in patients receiving OCs and are believed to be drug related: Nausea and/or vomiting, usually the most common adverse reactions, occur in approximately 10 percent or less of patients during the first cycle. Other reactions, as a general rule, are seen much less frequently or only occasionally: Gastrointestinal symptoms (such as abdominal cramps and bloating); breakthrough bleeding; spotting; change in menstrual flow; dysmenorrhea; amenorrhea during and after treatment; temporary infertility after discontinuance of treatment; edema; chloasma or melasma which may persist; breast changes: tenderness, enlargement and secretion; change in weight (increase or decrease); change in cervical erosion and cervical secretion; possible diminution in lactation when given immediately postpartum; cholestatic jaundice; migraine; increase in size of uterine leiomyomata; rash (allergic); mental depression; reduced tolerance to carbohydrates; vaginal candidiasis; change in corneal curvature (steepening); intolerance to contact lenses. The following adverse reactions have been reported in users of OCs, and the association has been neither confirmed nor refuted: Premenstrual-like syndrome; cataracts; changes in libido; chorea; changes in appetite; cystitis-like syndrome; headache; nervousness; dizziness; hirsutism; loss of scalp hair; erythema multiforme; erythema nodosum; hemorrhagic eruption; vaginitis; porphyria; hemolytic uremic syndrome. **ACUTE OVERDOSE:** Serious ill effects have not been reported following acute ingestion of large doses of OCs by young children. Overdosage may cause nausea, and withdrawal bleeding may occur in females. **HOW SUPPLIED:** Loestrin **21** 1/20 is available in dispensers each containing 21 tablets. Each tablet contains 1 mg of norethindrone acetate and 20 mcg of ethinyl estradiol. Available in packages of five dispensers. Loestrin **Fe** 1/20 is available in dispensers each containing 21 white tablets and 7 brown tablets. Each white tablet contains 1 mg of norethindrone acetate and 20 mcg of ethinyl estradiol. Each brown tablet contains 75 mg ferrous fumarate. Available in packages of five dispensers. Loestrin **21** 1.5/30 is available in dispensers each containing 21 tablets. Each tablet contains 1.5 mg of norethindrone acetate and 30 mcg of ethinyl estradiol. Available in packages of five dispensers. Loestrin **Fe** 1.5/30 is available in dispensers each containing 21 green tablets and 7 brown tablets. Each green tablet contains 1.5 mg of norethindrone acetate and 30 mcg of ethinyl estradiol. Each brown tablet contains 75 mg ferrous fumarate. Available in packages of five dispensers.

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UPDATE

Abortion: No Psychological Toll

Serious psychological problems following induced abortion are rare, according to a wide-ranging review of the psychological literature.[1] On the contrary, relief and happiness are much more common short-term reactions in the weeks after the abortion of an unwanted pregnancy, while distress and depression are more commonly reported before the abortion than after the procedure has occurred. However, some women do experience negative psychological reactions after abortion: The reviewers assert that such responses are often related to uncertainty about whether to have an abortion and delay in making the decision, the lack of support from others concerning the abortion and the need to terminate a wanted pregnancy (for example, in the case of serious fetal defect). They point out that while there is no evidence that legal induced abortion causes serious subsequent psychological problems, the existing studies of this subject have many methodological shortcomings and better research needs to be conducted.

1. N. E. Adler et al., "Psychological Responses After Abortion," *Science*, **248**:41, 1990.

Kids Cut Female MDs' Practice Time

Female doctors with children spend significantly fewer hours practicing medicine than do their male counterparts who are fathers, but there is no comparable differential between women and men who are not parents.[1] According to a survey of 204 young physicians (57 female and 147 male), female physicians spent significantly less time practicing medicine than did male physicians (44 hours per week vs. 53 hours); however, this gender difference was confined almost exclusively to doctors who were parents (38 hours vs. 53 hours), and there was no significant difference in weekly practice hours among nonparents (50 hours vs. 52 hours). Female doctors with children also reported spending significantly more time with their children each week than did the male doctors (44 hours vs. 29 hours). Still, the female physicians who were parents worked almost exactly as many hours as they believed were ideal, while fathers and childless physicians of both sexes tended to work more hours than they thought ideal. Thus, as in other professions, parenthood tends to reduce the working hours of mothers but not of fathers, although the investigators observe that "the close correspondence between mothers' actual practice hours and [their] ideal practice suggests that mothers are acting upon preferences to work less."

1. L. Grant et al., "Gender, Parenthood and Work Hours of Physicians," *Journal of Marriage and the Family*, 52:39, 1990.

AIDS Cases Exploding in USSR

Until October 1988, only one citizen of the Soviet Union had been documented as having AIDS; in subsequent years, however, the number of officially admitted cases of the disease has increased dramatically.[1] According to a report by Zhores Medvedev, a distinguished Soviet scientist, many cases of infection with the human immunodeficiency virus (HIV) have been traced to inadequate sterilization of hypodermic needles or syringes or to the use of tainted blood in transfusions. During 1988, official concern about the possibility of an undocumented AIDS epidemic had grown so great that test kits were mass produced and large-scale immunologic testing of the population was begun. By early 1989, testing of about 17 million people had disclosed that 112 Soviet citizens and 334 foreign visitors were seropositive for HIV infection. A few months later, 58 infants and nine new mothers in one city were found to be infected with HIV; all of these cases were believed to have spread from one newborn because of inadequate sterilization of syringes. A few weeks after that initial discovery, an outbreak among 23 children and one adult was detected in another city; again, the infections were traced to the reuse of dirty needles and syringes. The author points out that all Soviet citizens who have lived abroad in the past decade are required to be tested, but because the law threatens anyone found seropositive with lifelong quarantine, those who are at risk may not cooperate with detection efforts. He also observes that cases of infectious hepatitis B more than tripled between 1974 and 1989, with much of that increase linked directly to medical procedures; thus, the author concludes that "if hepatitis B [is] so rampant within the medical service, there [is] nothing to prevent the spread of HIV as well."

1. Z. A. Medvedev, "Evolution of AIDS Policy in the Soviet Union: II. The AIDS Epidemic and Emergency Measures," *British Medical Journal*, **300**:932, 1990.

Smoking Promotes Pelvic Infection

Cigarette smoking may increase the risk of pelvic inflammatory disease (PID) among women, whether they are current smokers or only smoked in the past.[1] A case-control analysis of 192 women with PID and 642 without PID that controlled for the women's age, race, education, marital status, number of recent sex partners, frequency of intercourse, number of episodes of gonorrhea and current contraceptive method showed that current smokers are 70 percent more likely than those who have never smoked to require hospitalization for treatment of PID and that former smokers (those who quit more than three months before the interview) are more than twice as likely as nonsmokers to develop serious PID. The researchers suggest that if the association between smoking and PID is causal, "the predominant mechanism of action is likely to be a permanent or long-lasting change in anatomy, physiology or both that is not yet fully understood."

1. P. A. Marchbanks, N. C. Lee and H. B. Peterson, "Cigarette Smoking As a Risk Factor for Pelvic Inflammatory Disease," *American Journal of Obstetrics and Gynecology,* **162**:639, 1990.

Risky Behavior and Family Structure

Children from single-parent households or those with a stepparent are substantially more likely than children from intact families to smoke cigarettes, use drugs and have sexual intercourse.[1] An analysis of data from a survey of more than 2,000 young people from the southeastern United States revealed that children from single-parent families were at least one and one-half times as likely as those living with both parents to have tried cigarettes or alcohol and were more than twice as likely as young people from two-parent families to have used marijuana or to have had sexual intercourse. This effect was not diminished when parental smoking or the teenagers' religiosity were controlled for. The investigators conclude that their results "serve to reinforce the importance of the family environment for influencing the initiation of potentially detrimental behavioral patterns in children."

1. R. L. Flewelling and K. E. Bauman, "Family Structure As a Predictor of Initial Substance Use and Sexual Intercourse in Early Adolescence," *Journal of Marriage and the Family,* **52**:171, 1990.

Which Teenagers Will Use Condoms?

About one-third of a sample of sexually active 16–19-year-olds from Massachusetts who were surveyed by phone in 1988 reported that they always use condoms, and another third said that they sometimes use them.[1] However, the respondents with the most sexual partners in the year preceding the survey were least likely to have always used condoms during sexual intercourse, and those who had drank heavily or used drugs were somewhat less likely than the others to have done so. When the investigators compared the respondents' condom use with their responses to a number of questions on their beliefs about and attitudes toward AIDS and condoms, they found that those who thought condoms protect very well against HIV transmission and those who did not believe that condoms reduce sexual pleasure were more than three times as likely as other respondents to have been consistent condom users. Younger teenagers, those who carried condoms with them, those who were not embarrassed if they were asked to use a condom and those who did not drink were also significantly more likely than the rest of the respondents to use condoms at every act of intercourse.

1. R. W. Hingson et al., "Beliefs About AIDS, Use of Alcohol and Drugs, and Unprotected Sex Among Massachusetts Adolescents," *American Journal of Public Health,* **80**:295, 1990.

Cervical Cancer Linked to Virus

Human papillomavirus infection is highly associated with invasive cervical cancer, according to a study of nearly 400 gynecologic patients visiting a specialist in colposcopy.[1] Papillomavirus DNA was detected in tissue samples taken from 58 percent of the women with cervical neoplasia but in only 10 percent of samples from women with a cytologically normal cervix. When a number of potentially confounding factors were controlled for, the analysis revealed that women with neoplasia were 10 times more likely than those with a normal cervix to be infected with papillomavirus. Although oral contraceptive users were significantly more likely to have had neoplasia, pill use was also associated with papillomavirus infection: Among women with cervical neoplasia, 73 percent of those who had been using oral contraceptives were found to have papillomavirus infections, compared with 56 percent of women who had not used them; among those with a normal cervix, papillomavirus was detected in 26 percent of those who were taking the pill but in just six percent of those who were not oral contraceptive users. Because the investigators lacked information on the women's sexual activity, they were unable to explore further the associations between pill use, human papillomavirus infection and cervical cancer.

1. A. T. Lorincz et al., "Temporal Associations of Human Papillomavirus Infection with Cervical Cytologic Abnormalities," *American Journal of Obstetrics and Gynecology,* **162**:645, 1990.

No Spermicide–Birth Defect Link

Maternal spermicide use does not appear to increase the risk of fetal defect, spontaneous abortion, prematurity or stillbirth.[1] A group of investigators examined the results of a number of previous studies of the effects of spermicide use on pregnancy outcome, employing the controversial technique of meta-analysis to combine and reanalyze the results of these studies. They found that the odds ratio for the risk of malformation resulting from use of spermicides was 1.02. The odds ratios calculated for case-control studies (1.12) did not differ significantly from those for cohort studies (0.99); furthermore, there was no significant difference between the odds ratios for studies that looked at the risk of malformations from spermicide use around the time of conception (1.06), in the first trimester of the pregnancy (0.98) or at any time during pregnancy (0.91). "The meta-analysis in this study," the authors conclude, "has shown that maternal use of spermicides is not associated with fetal malformations or any other reported abnormal fetal outcomes."

1. T. R. Einarson et al., "Maternal Spermicide Use and Adverse Reproductive Outcome: A Meta-Analysis," *American Journal of Obstetrics and Gynecology,* **162**:655, 1990.

Ectopic Pregnancy and Abortion

Paying greater attention to the symptoms of ectopic pregnancy and closely examining the products of conception after an abortion procedure could save women's lives, researchers from the Centers for Disease Control conclude. Between 1972 and 1985, 24 abortion patients in the United States died as a result of ectopic pregnancies: In most cases, ectopic pregnancy had not been suspected, and the women believed their pregnancies to have been terminated.[1] The mortality rate for ectopic pregnancies concurrent with induced abortion was slightly higher than the rate for all ectopic pregnancies (11.7 deaths per 10,000 cases vs. 8.7 per 10,000). Routine postabortion pathologic examinations revealed no sign of chorionic villi in the products of conception for 14 of the 24 women (an indication that the abortion was not complete), but the examinations were done after the women had left the clinic and the women either did not return for follow-up or could not be contacted. Nine of the women who died had visited a local emergency room because of symptoms of illness, but were misdiagnosed and sent home. The investigators emphasize that if the clinic staff had examined the products of conception for the presence of chorionic villi while the patient was still at the clinic and if hospital personnel were more familiar with the symptoms of ectopic pregnancy, most of these women might not have died.

1. H. K. Atrash, T. MacKay and C. J. R. Hogue, "Ectopic Pregnancy Concurrent with Induced Abortions: Incidence and Mortality," *American Journal of Obstetrics and Gynecology,* **162**:726, 1990.

Abortion Services in the United States, 1987 and 1988

By Stanley K. Henshaw and Jennifer Van Vort

Summary

A 1989 survey by The Alan Guttmacher Institute shows that 1.6 million abortions were performed in the United States in 1988, a number that has remained relatively unchanged since 1980. More than 98 percent of abortions in 1987–1988 were performed in metropolitan areas. Although 51 percent of metropolitan counties have no provider of abortion services, 93 percent of nonmetropolitan counties are without a provider. The lack of abortion services in nonmetropolitan areas has been intensified by a 13 percent reduction since 1985 in the number of hospitals that offer abortion services. The number of nonhospital facilities providing abortion services increased by four percent, however, and specialized clinics provided 64 percent of all abortions performed in 1988.

"The decline in the number of [abortion] providers has occurred entirely among hospitals. In 1977, there were 1,654 hospitals offering abortion services; the number fell to 1,405 in 1982, to 1,191 in 1985 and to 1,040 in 1988."

Introduction

Although induced abortion was legalized nationally in the United States by the Supreme Court decisions of 1973, abortion services did not automatically become available in all parts of the country. In many areas, physicians were slow to offer the services, and most hospitals either prohibited the procedures or had no affiliated physicians who chose to perform them. In 1974, in response to concerns about the availability of abortion services, The Alan Guttmacher Institute (AGI) conducted the first of a series of periodic surveys of all identifiable abortion providers in the country. These Abortion Provider Surveys were designed to obtain information about abortion service providers as well as the number of procedures performed. The last published report is based on the 1986 survey and covers the years 1984 and 1985.[1]

The AGI surveys have shown that gaps in service caused by the unwillingness of most hospitals and physicians to perform abortions have been partly filled by freestanding clinics and by a few private physicians who perform the procedure in their offices, but that in many geographic areas, women live dozens or even hundreds of miles from the nearest abortion provider. Information from the surveys on the extent to which American women have recourse to abortion has proved useful in assessing teenage pregnancy rates[2] and calculating contraceptive failure probabilities.[3] Presented here are the results of the tenth survey, including new information on service availability and utilization for 1987 and 1988.

Methodology

In June 1989, questionnaires were mailed to all hospitals, clinics and physicians' offices where abortions were believed to have been performed in 1987 or 1988. The mailing list included all facilities surveyed in 1986, except those that did not perform abortions in 1985 or were known to have closed before 1987, as well as possible new providers. The latter were suggested by affiliates of Planned Parenthood and the National Abortion Rights Action League, which supplied names of additional doctors and facilities in their areas believed to offer abortion services. Others were identified through the Yellow Pages of major cities and the membership directory of the National Abortion Federation, and from newspaper articles. These methods yielded 3,422 possible providers.

The questionnaire asked, among other questions, if these facilities provided abortions, and if so, the number of induced abortions (including endometrial aspirations and menstrual regulations) performed in 1987 and 1988. Facilities that did not respond to the first mailing were sent as many as three additional questionnaires. State health department data were used, when available, to provide missing information on the numbers of abortions performed in individual facilities. The remaining nonrespondents were contacted by telephone; in some cases, a dozen or more calls were necessary before data were obtained or a final refusal received. Because antiabortion harassment has made some providers increasingly reluctant to release data pertaining to abortion, efforts were more intensive than in previous surveys. Health departments provided information on an additional 76 providers that had not previously been identified, bringing the total to 3,498 known or possible providers.

Information about the availability and number of abortions was obtained from the providers themselves or from the state health departments for 3,169 facilities. The remaining 329 facilities either did not respond to requests for data (265) or had closed or moved and could not be located (64). For 97 of these providers, estimates of the number of abortions performed in 1987 and 1988 were obtained from knowledgeable sources in the community. These

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Stanley K. Henshaw is deputy director of research and Jennifer Van Vort is senior research assistant at The Alan Guttmacher Institute. The authors would like to thank senior research assistant Theresa Camelo for her invaluable assistance with this project. The research on which this article is based was funded in large part by The Robert Sterling Clark Foundation, The David and Lucile Packard Foundation and an anonymous foundation.

tended to be smaller providers, and together they represent only 1.1 percent of the abortions counted. We estimated data for an additional 70 facilities that did not respond but which we were sure provided abortions, including a large organization with 22 locations mainly in Southern California, and 48 other providers. Because of the large number of abortions involved and because some earlier data on these providers were available, we projected the number of abortions performed, using data from previous years and taking into account trends over time. Estimations for these 70 providers represent 8.2 percent of all abortions in 1988.

The remaining 162 facilities for which no data or estimates are available had provided about 9,000 abortions in 1985, although some of these facilities had not responded that year either. No projections were made for these facilities and they were not counted as providers in 1987–1988. Some additional providers were undoubtedly missed because they were not identified. Most of the overlooked providers are probably small ones, since facilities where large numbers of abortions are performed are generally known to those in the area who are involved in issues related to women's health and abortion. In an earlier study comparing results from the AGI's Abortion Provider Survey with an independent survey of private physicians, we estimated that the provider survey may have missed some 110,000 abortions performed in physicians' offices in 1982, for an overall undercount of 6.5 percent.[4] The undercount in the current survey is likely to be similar.[*] (Such undercounts may be partly offset, however, by two factors: Overcounting may occur when abortion facilities are listed under two different names and counted twice; and, according to previous surveys, physicians tend to overestimate the number of abortions they provide.)

Over the years, the number of abortions reported to the AGI has been higher in every survey than the number reported by the Centers for Disease Control (CDC), the other source of national data on abortion.[5] The amount by which the AGI national abortion counts exceed those of the CDC ranges from 18 percent in 1977 and 1978 to 13 percent in 1987. The CDC data for most states are obtained from state health departments, some of which do not receive information from all providers and may receive incomplete information from others. The AGI figures for most states and for the nation as a whole are therefore believed to be more accurate.

Table 1. Number of reported abortions, by metropolitan status; rate of abortions per 1,000 women aged 15–44; and ratio of abortions per 100 pregnancies ending in abortions or live births; United States, 1973–1988

Year	No. of abortions (in 000s)			Rate	Ratio*
	Total	Metro†	Non-metro		
1973	744.6	720.2	24.4	16.3	19.3
1974	898.6	860.7	37.9	19.3	22.0
1975	1,034.2	985.7	48.5	21.7	24.9
1976	1,179.3	1,123.3	56.0	24.2	26.5
1977	1,316.7	1,258.0	58.7	26.4	28.6
1978	1,409.6	1,345.2	64.4	27.7	29.2
1979	1,497.7	1,430.9	66.8	28.8	29.6
1980	1,553.9	1,507.7	46.2	29.3	30.0
1981	1,577.3	1,538.3	39.0	29.3	30.1
1982	1,573.9	1,537.3	36.6	28.8	30.0
1983	(1,575.0)	u	u	(28.5)	(30.4)
1984	1,577.2	1,543.9	33.3	28.1	29.7
1985	1,588.6	1,556.4	32.2	28.0	29.7
1986	(1,574.0)	u	u	(27.4)	(29.4)
1987	1,559.1	1,532.0	27.1	26.9	28.9
1988	1,590.8	1,563.4	27.4	27.3	28.8

*For each year, the ratio is based on births occurring during the 12-month period starting in July of that year (to match times of conception for pregnancies ending in births with those for pregnancies ending in abortions).

†For 1973–1979, metropolitan status has been defined according to criteria published by the Office of Management and Budget (OMB), Oct. 1975. For 1980–1988, definitions by the OMB based on the 1980 census have been used.

Notes: Figures in parentheses are estimated by interpolation of numbers of abortions; u=unavailable.

Sources: **Abortion by metropolitan status**—1973–1985: see reference 1, Table 1. 1987–1988: AGI Abortion Provider Survey. **Population data**—1973–1985: see reference 1, Table 1. 1986–1988: U.S. Bureau of the Census, "State Population and Household Estimates with Age, Sex, and Components of Change: 1981–88," *Current Population Reports*, Series P–25, No. 1044, 1989, Tables 7–8. **Birth data**—1973–1984: see reference 1, Table 1. 1985–1987: National Center for Health Statistics (NCHS), "Advance Report of Final Natality Statistics," *Monthly Vital Statistics Report*, Vol. 36, No. 4, Supplement, 1987 [for 1985]; Vol. 37, No. 3, Supplement, 1988 [for 1986]; Vol. 38, No. 3, Supplement, 1989 [for 1987]. 1988–1989: NCHS, "Births, Marriages, Divorces, and Deaths for June 1989," *Monthly Vital Statistics Report*, Vol. 38, No. 6, 1989.

Trends in U.S. Abortion Statistics

From 1973 to 1976, the number of abortions performed in the United States rose sharply as legal abortion services became available, thereby supplanting the numbers of both illegal abortions and unplanned births (Table 1). Between 1976 and 1980, the number of abortions continued to rise gradually, probably reflecting an increase in the number of unplanned pregnancies. However, the annual number of abortions has been remarkably stable since 1980; year-to-year fluctuations between 1980 and 1988 were small enough to be within the margin of error of the surveys. Results of the latest survey show that in 1988, as in each of the previous eight years, approximately 1.6 million abortions were performed. From the late 1960s, when states began to liberalize their laws, through 1988, 23.6 million legal abortions have been performed; 22.3 million of these occurred since *Roe* v. *Wade* was decided in 1973.

Almost all abortions in the United States occur in metropolitan areas. In 1988, only 27,000, or 1.7 percent, took place in nonmetropolitan counties; this represents a continued decrease from a peak of 67,000 (4.5 percent) in 1979. The abortion rate in 1988 was 27 per 1,000 women aged 15–44, slightly lower than the rate in 1985 (28 per 1,000) and 1980 (29 per 1,000). The abortion ratio has also fallen slightly since 1980—from 30 to 29 per 100 pregnancies that result in births or abortions—because of an increase in the number of births during the period.[6] The abortion ratio of 29 means that about 29 percent of pregnancies not ending in miscarriage or stillbirth were terminated by abortion. When miscarriages and stillbirths are included, the proportion is 25 percent.

One of the survey questions asked the number of abortions performed during the first quarters of 1988 and 1989; this allowed us to calculate the trend in the number of abortions performed by continuing providers. The question was answered only by providers who returned the original questionnaire and had access to this information; no such data were obtained for those who responded to telephone queries, those who returned a special short form of the questionnaire, or those whose data came from state health departments. The providers answering the question, who provided 56 percent of all 1988 abortions, indicated that collectively they performed three percent more abortions in the first quarter of 1989 than in the same period of 1988, which suggests that the number of abortions may have increased slightly in 1989.[†]

Abortion rates by state of occurrence vary dramatically (Table 2—page 104). Variations between the states may result from a number of factors, including differences in the availability of abortion services, the proportion of the population that

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[*] For a more detailed explanation of the survey methodology, which was essentially the same as that used in 1986, and for state and national statistics for previous years, see S. K. Henshaw and J. Van Vort, eds., *Abortion Services in the United States, Each State and Metropolitan Area, 1984–1985*, The Alan Guttmacher Institute, New York, 1988, pp. 71–118.

[†] This conclusion assumes that the number of large-scale providers did not decrease between 1988 and 1989. This assumption seems reasonable, since there was a small increase in these providers between 1987 and 1988.

Table 2. Number of reported abortions, rate per 1,000 women aged 15–44, and absolute change in rate, by state of occurrence, 1985, 1987 and 1988

State	No. of abortions			Abortion rate			Rate change 1985–1988
	1985	1987	1988	1985	1987	1988	
Total	**1,588,550**	**1,559,110**	**1,590,750**	**28.0**	**26.9**	**27.3**	**–0.7**
Alabama	19,380	19,630	18,220	20.2	20.2	18.7	–1.5
Alaska	3,450	2,560	2,390	27.7	19.7	18.2	–9.5
Arizona	22,330	22,130	23,070	29.9	28.2	28.8	–1.1
Arkansas	5,420	7,030	6,250	10.1	13.1	11.6	1.5
California	304,130	300,830	311,720	47.9	45.0	45.9	–2.1
Colorado	24,350	18,850	18,740	28.8	22.4	22.4	–6.4
Connecticut	21,850	22,380	23,630	29.3	29.4	31.2	1.8
Delaware	4,590	5,680	5,710	30.9	35.9	35.7	4.8
District of Columbia	23,910	25,840	26,120	145.9	158.5	163.3	17.4
Florida	76,650	80,560	82,850	31.8	31.2	31.5	–0.3
Georgia	38,340	36,030	36,720	26.1	23.3	23.5	–2.6
Hawaii	11,160	11,290	11,170	43.7	44.1	43.0	–0.7
Idaho	2,660	1,980	1,920	11.1	8.5	8.2	–2.8
Illinois	64,960	72,180	72,570	23.8	26.2	26.4	2.6
Indiana	16,090	14,750	15,760	12.2	11.2	11.9	–0.2
Iowa	9,930	8,900	9,420	15.0	13.8	14.6	–0.4
Kansas	10,150	11,430	11,440	18.2	20.2	20.1	2.0
Kentucky	9,820	11,550	11,520	11.0	13.1	13.0	2.0
Louisiana	19,240	16,550	17,340	17.4	15.4	16.3	–1.1
Maine	4,960	4,950	4,620	18.6	17.7	16.2	–2.4
Maryland	29,480	31,240	32,670	26.9	27.6	28.6	1.7
Massachusetts	40,310	41,490	43,720	29.3	28.7	30.2	0.9
Michigan	64,390	61,060	63,410	28.7	27.3	28.5	–0.3
Minnesota	16,850	17,810	18,580	16.6	17.5	18.2	1.6
Mississippi	5,890	5,430	5,120	9.7	8.9	8.4	–1.3
Missouri	20,100	20,190	19,490	17.3	17.0	16.4	–0.9
Montana	3,710	3,280	3,050	19.0	17.7	16.5	–2.5
Nebraska	6,680	6,580	6,490	18.2	18.0	17.7	–0.4
Nevada	9,910	10,710	10,190	40.5	43.9	40.3	–0.2
New Hampshire	7,030	4,680	4,710	29.0	17.8	17.5	–11.5
New Jersey	69,190	63,570	63,900	39.6	34.9	35.1	–4.5
New Mexico	6,110	6,650	6,810	17.4	18.6	19.1	1.8
New York	195,120	184,420	183,980	47.4	43.3	43.3	–4.0
North Carolina	34,180	37,630	39,720	22.6	24.2	25.4	2.8
North Dakota	2,850	2,560	2,230	18.5	17.0	14.9	–3.6
Ohio	57,360	51,490	53,400	22.4	20.2	21.0	–1.4
Oklahoma	13,100	11,000	12,120	17.1	14.5	16.2	–0.9
Oregon	15,230	14,370	15,960	22.3	21.8	23.9	1.7
Pennsylvania	57,370	51,800	51,830	21.3	18.9	18.9	–2.4
Rhode Island	7,770	7,390	7,190	35.5	31.3	30.6	–4.9
South Carolina	11,200	12,770	14,160	13.7	15.2	16.7	3.1
South Dakota	1,650	860	900	10.6	5.5	5.7	–4.9
Tennessee	22,350	22,050	22,090	19.1	18.9	18.9	–0.2
Texas	100,820	100,210	100,690	25.5	24.7	24.8	0.7
Utah	4,440	4,830	5,030	11.1	12.4	12.8	1.7
Vermont	3,430	3,690	3,580	26.2	26.9	25.8	–0.5
Virginia	34,180	34,410	35,420	24.0	23.3	23.7	–0.3
Washington	30,990	29,840	31,220	28.0	26.9	27.6	–0.4
West Virginia	4,590	2,990	3,270	10.1	6.8	7.5	–2.6
Wisconsin	17,830	18,330	18,040	15.7	16.3	16.0	0.2
Wyoming	1,070	680	600	7.9	5.7	5.1	–2.8

Note: In this and subsequent tables, numbers of abortions are rounded to the nearest 10.

Sources: **1985**—see reference 1. **1987–1988**—See sources to Table 1.

is nonwhite or Hispanic (characteristics that are associated with above-average abortion rates), the degree of urbanization (rates tend to be higher in large cities) and state policies, especially public payment for abortion services for low-income women. The highest rate in 1988, 46 abortions per 1,000 women of childbearing age in California, was nine times that of Wyoming, which had the lowest rate (5 per 1,000). The other states with rates of 40 or higher were New York (43), Hawaii (43) and Nevada (40). Like other large cities, the District of Columbia has a higher rate (163) than any state. At the other extreme are states with rates below 10 abortions per 1,000 women: Wyoming (5), South Dakota (6), West Virginia (8), Idaho (8), and Mississippi (8). These are rural states with relatively few places where women can obtain abortion services.

In general, rates are highest on the East and West Coasts (not shown). The Pacific and mid-Atlantic census divisions had the highest rates in 1988 (42 and 34 abortions per 1,000 women aged 15–44, respectively), followed by the New England and South Atlantic regions (both 28 per 1,000). The lowest rates occurred in the East South Central and West North Central census divisions (16 and 17 per 1,000).

Table 2 shows the changes in the abortion rates between 1985 and 1988, but because such changes can be strongly influenced by small errors in the data, they should be interpreted with caution. Errors can be introduced by incomplete or inconsistent reporting of abortions by the providers and by inaccurate estimates of the size of the female population aged 15–44. Sharp drops in state abortion rates of 25 percent or more occurred between 1985 and 1988 in six states, all of which already had relatively low rates in 1985: South Dakota (46 percent drop), New Hampshire (40 percent), Wyoming (36 percent), Alaska (34 percent), Idaho (26 percent), and West Virginia (25 percent). In all these states, physicians or clinics that had been providing a large proportion of the abortions in 1985 either retired or discontinued their services. In South Dakota, for example, one of the two physicians who had been performing abortions retired, leaving women in the western and central parts of the state as far as 200 miles from the nearest provider. North Dakota has also been left with only one provider of abortion services since the retirement of a physician in February 1990. The decline in abortions performed in these states may lead to an overestimation of the decline in the number of residents obtaining abortions, since more women may be traveling out of state for abortion services.

The only abortion rate increases of 15 percent or more from 1985 to 1988 occurred in Delaware (16 percent), Kentucky (18 percent) and South Carolina (22 percent). In Delaware and South Carolina, new providers began offering abortion services during this period and established providers increased their caseloads. The increase from 146 to 163 abortions per 1,000 women aged 15–44 in the District of Columbia represents a partial return to a higher rate of 170 abortions reported in 1982; the drop had been caused by the closing of a major clinic. Among the census divisions, the largest changes in abortion rates were declines of nine percent in the mid-Atlantic states and seven percent in the Mountain states (not shown). Changes in other census divisions were minor.

The data collected by the Abortion Provider Survey are recorded according to the state where the abortions were performed and reflect the presence of services (Table 3). When analyzing abortion utilization, however, it is more appropriate to compare rates of abortions obtained by residents of the states rather than the rates of abortions occurring in the states. For each state, the percentage distribution of abortions performed according to the women's state of residence has been obtained from the CDC or estimated from AGI sample surveys of providers. This information has been used to estimate the abortion rates among residents of each state in 1985, the most recent year for which the data are available.

In Arkansas, Indiana, Maryland, Mississippi and Wyoming, the abortion rates among residents (shown in Table 3) are substantially higher than the rates of abortions occurring in those states in 1985 (shown in Table 2) because many residents travel to other states for abortion services. Low occurrence rates by state often reflect a lack of services: In the 10 states where fewer than 15 abortions per 1,000 women were performed in 1985 (Arkansas, Idaho, Indiana, Kentucky, Mississippi, South Carolina, South Dakota, Utah, West Virginia and Wyoming), an average of 26 percent of the residents who obtained abortions went to other states for the services.

In the District of Columbia, on the other hand, the 1985 resident rate of 75 abortions per 1,000 women is much lower than the rate of 146 abortions performed per 1,000 women shown in Table 2 because many women from Maryland and Virginia go to Washington, D.C., for abortions. Delaware, Kansas, North Dakota, New Hampshire, Rhode Island and Vermont also have lower resident rates than occurrence rates because of the numbers of out-of-state women served.

Table 3. Total number of abortions and number and percentage provided to nonresidents, by state; total number of abortions and number and percentage obtained out of state, by woman's state of residence; and resident abortion rate per 1,000 women 15–44; 1985

State	Abortions provided (by state)			Abortions obtained (by residents)			Resident abortion rate
	Total	To nonresidents		Total	Out of state		
		N	%		N	%	
Total	**1,588,550**	**96,570**	**6**	**1,578,800***	**88,820***	**6**	**27.6**
Alabama	19,380	1,170	6	19,620	1,410	7	20.5
Alaska	3,450	0	0	3,780	330	9	30.4
Arizona	22,330	600	3	22,590	860	4	30.2
Arkansas	5,420	190	4	7,050	1,820	26	13.2
California	304,130	1,440	†	304,120	1,430	†	47.9
Colorado	24,350	1,450	6	23,120	220	1	27.4
Connecticut	21,850	580	3	22,780	1,510	7	30.6
Delaware	4,590	1,490	32	3,490	390	11	23.5
District of Columbia	23,910	12,280	51	12,340	710	6	75.3
Florida	76,650	6,910	9	70,750	1,010	1	29.4
Georgia	38,340	3,090	8	37,860	2,610	7	25.7
Hawaii	11,160	140	1	11,030	10	†	43.2
Idaho	2,660	210	8	3,060	610	20	12.7
Illinois	64,960	1,360	2	67,490	3,890	6	24.7
Indiana	16,090	540	3	20,970	5,420	26	15.9
Iowa	9,930	750	8	10,870	1,690	16	16.4
Kansas	10,150	3,850	38	7,190	890	12	12.9
Kentucky	9,820	3,730	38	8,690	2,600	30	9.7
Louisiana	19,240	2,230	12	19,000	1,990	10	17.2
Maine	4,960	730	15	5,190	960	18	19.5
Maryland	29,480	1,650	6	37,940	10,110	27	34.7
Massachusetts	40,310	1,410	3	42,180	3,280	8	30.6
Michigan	64,390	1,890	3	63,390	890	1	28.3
Minnesota	16,850	1,580	9	16,030	760	5	15.8
Mississippi	5,890	370	6	7,570	2,050	27	12.4
Missouri	20,100	2,800	14	21,800	4,500	21	18.8
Montana	3,710	650	18	3,210	150	5	16.4
Nebraska	6,680	1,350	20	5,780	450	8	15.7
Nevada	9,910	1,230	12	9,100	420	5	37.2
New Hampshire	7,030	1,990	28	5,960	920	15	24.6
New Jersey	69,190	1,980	3	71,940	4,730	7	41.2
New Mexico	6,110	200	3	7,160	1,250	17	20.4
New York	195,120	7,790	4	189,840	2,510	1	46.1
North Carolina	34,180	1,810	5	33,880	1,510	4	22.4
North Dakota	2,850	1,390	49	1,610	150	9	10.4
Ohio	57,360	3,260	6	55,720	1,620	3	21.8
Oklahoma	13,100	690	5	13,380	970	7	17.5
Oregon	15,230	1,260	8	14,520	550	4	21.2
Pennsylvania	57,370	2,580	4	59,360	4,570	8	22.1
Rhode Island	7,770	1,870	24	6,170	270	4	28.2
South Carolina	11,200	610	5	12,700	2,110	17	15.5
South Dakota	1,650	400	24	1,630	380	23	10.5
Tennessee	22,350	3,850	17	20,090	1,590	8	17.1
Texas	100,820	5,890	6	96,620	1,690	2	24.5
Utah	4,440	340	8	4,440	340	8	11.1
Vermont	2,430	990	29	2,820	380	13	21.6
Virginia	34,180	2,000	6	37,470	5,290	14	26.4
Washington	30,990	1,890	6	30,370	1,270	4	27.4
West Virginia	4,590	830	18	5,200	1,440	28	11.4
Wisconsin	17,830	1,270	7	17,740	1,180	7	15.7
Wyoming	1,070	10	1	2,190	1,130	52	16.2

*Excludes an estimated 9,750 nonresidents of the United States who obtained abortions in the United States. About 3,500 of these are Canadian, 1,900 Mexican, and most of the remainder are from the Caribbean area.

†Fewer than 0.5 percent.

Sources: **Number of abortions**—AGI survey and unpublished data compiled by the Centers for Disease Control. **Number of women**—see sources to Table 1.

Geographic Availability

The distance a woman has to travel for abortion services can be an important determinant of whether she is able to obtain the services when she needs them. Lack of local services makes it harder for women to obtain information about facilities, and, if they do, they may face other difficulties: prohibitive travel expenses, the need for overnight lodging and the loss of pay due to absence from work. In addition, rapid diagnosis and treatment of postabortion complications are more difficult, and privacy is jeopardized by the need to be away from home and work for a longer period. Research has shown that the greater the distance from an abortion provider, the less likely a woman is to gain access to the service.[7]

Table 4. Number of counties, number and percentage with an abortion provider and number with a large-scale provider,* by state, 1988

State	No. of counties	Counties with		
		Any provider		Large-scale provider
		N	%	N
U.S. total	**3,135**	**536**	**17**	**261**
Alabama	67	6	9	5
Alaska	23	6	26	1
Arizona	14	3	21	2
Arkansas	75	3	4	2
California	58	40	69	26
Colorado	63	16	25	6
Connecticut	8	7	88	4
Delaware	3	3	100	2
Dist. of Col.	1	1	100	1
Florida	67	20	30	18
Georgia	159	21	13	5
Hawaii	4	4	100	2
Idaho	44	4	9	1
Illinois	102	9	9	8
Indiana	92	12	13	4
Iowa	99	7	7	2
Kansas	105	10	10	3
Kentucky	120	2	2	2
Louisiana	64	5	8	5
Maine	16	10	63	1
Maryland	24	15	63	6
Massachusetts	14	12	86	7
Michigan	83	21	25	12
Minnesota	87	5	6	3
Mississippi	82	3	4	3
Missouri	115	7	6	6
Montana	56	6	11	3
Nebraska	93	2	2	2
Nevada	17	2	12	2
New Hampshire	10	4	40	2
New Jersey	21	16	76	11
New Mexico	32	8	25	2
New York	62	48	77	18
North Carolina	100	42	42	10
North Dakota	53	3	6	3
Ohio	88	11	13	7
Oklahoma	77	4	5	3
Oregon	36	12	33	5
Pennsylvania	67	19	28	8
Rhode Island	5	2	40	1
South Carolina	46	6	13	3
South Dakota	66	1	2	1
Tennessee	95	11	12	5
Texas	254	22	9	15
Utah	29	2	7	1
Vermont	14	7	50	2
Virginia	136	29	21	8
Washington	39	14	36	7
West Virginia	55	3	5	1
Wisconsin	72	6	8	4
Wyoming	23	4	17	0

*A provider of 400 or more abortions in 1988.

The proportion of women who obtain abortions outside their home states is an indicator of the lack of local services. Table 3 shows that in Wyoming, more than half the residents who obtained abortions in 1985 did so in other states, as did 20 percent or more of the women residing in Arkansas, Idaho, Indiana, Kentucky, Maryland, Missouri, Mississippi, South Dakota and West Virginia who had abortions. Except for Maryland, many of whose residents use health services in the District of Columbia, all these states have resident abortion rates under 20 per 1,000. While distance from providers may not be the only cause of low rates in these states, it may be preventing some women from obtaining needed services. In the same year, 20 percent or more of abortions in nine states (Delaware, Kansas, Kentucky, Nebraska, New Hampshire, North Dakota, Rhode Island, South Dakota and Vermont) and the District of Columbia were provided to out-of-state residents. Nationally, six percent of all abortions in 1985 were obtained out of state.

Other indicators of the availability of abortion services are the proportion of counties that have a provider and the proportion that have a large-scale provider (Table 4). The proportion of U.S. counties that have abortion providers has been decreasing since the late 1970s. This decline has been concentrated among counties with only small facilities; the proportion of counties with providers of 400 or more abortions per year has remained stable or increased slightly in recent years (not shown). Only about half as many nonmetropolitan counties had services in 1988 as in 1977 (seven and 14 percent, respectively).

The proportion of counties with abortion services varies widely by state and is associated with state abortion rates. As shown in Table 4, one state, South Dakota, had only one county with an abortion provider in 1988, and in 17 other states fewer than 10 percent of the counties had a provider. The resident abortion rate is below 20 per 1,000 women in all but three of these states. In 10 states, at least half of the counties have abortion services, and seven of the 10 have resident rates above 30. It should be noted, of course, that a causal connection between the availability of services and abortion rates is not proven by these associations, since abortion services may gravitate towards areas with greater demand and other factors may contribute to low rates in states with few services.

As shown in Table 5, 83 percent of U.S. counties have no identified abortion services; 31 percent of women of reproductive age live in these counties. An additional four percent of counties where four percent of women live have facilities that reported 10 or fewer abortions in 1988; such facilities are usually hospitals that perform abortions in rare emergency cases or private physicians who serve established patients only. Only eight percent of counties, where 58 percent of women live, have a large-scale facility (one that provides 400 or more abortions per year). Women in nonmetropolitan counties are more likely than those in metropolitan counties to have to cross county lines to obtain abortion services. Eighty-three percent of nonmetropolitan women live in the 93 percent of nonmetropolitan counties without a provider. In contrast, just 16 percent of metropolitan women live in the 51 percent of metropolitan counties that have no provider.

According to the 1985 survey, 81 of the country's 305 standard metropolitan statistical areas (SMSAs)* either had no provider or had providers reporting a total of fewer than 50 abortions. At least 400 abortions would have been performed per year in each of these SMSAs if their abortion rates met the national average. In 1988, nine additional SMSAs joined this underserved category. These 90 SMSAs include 70 that have no identified provider and 20 with providers that together reported fewer than 50 procedures.† They are located in 33 different states in all parts of the country except New England; Indiana, Ohio, Pennsylvania, Texas and Wisconsin each have six or more.

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*An SMSA consists of a county containing a city of 50,000 or more people, plus any surrounding metropolitan counties. All metropolitan counties are included in SMSAs. We have used the definitions of SMSAs published by the Office of Management and Budget after the 1980 census.

†The 90 SMSAs that have no abortion provider or that reported fewer than 50 abortions (shown in italics) in 1988 are: Alabama—Anniston, *Florence,* Gadsden; Arkansas—*Fort Smith,* Pine Bluff, Texarkana; California—*Visalia, Yuba City;* Colorado—Pueblo; Florida—Bradenton, Panama City; Georgia—*Albany,* Athens; Illinois—Bloomington, Decatur, Kankakee, Springfield; Indiana—Anderson, Elkhart, *Evansville,* Kokomo, Muncie, Terre Haute; Iowa—Davenport, Dubuque, Sioux City; Kansas—*Topeka;* Kentucky—Owensboro; Louisiana—Alexandria, Lafayette, Lake Charles, Monroe; Maine—Lewiston; Maryland—*Cumberland;* Michigan—Battle Creek, *Bay City;* Minnesota—St. Cloud; Mississippi—Pascagoula; Missouri—Joplin, St. Joseph; New Jersey—Vineland; New Mexico—*Las Cruces;* North Carolina—*Burlington;* North Dakota—Bismarck; Ohio—*Canton, Hamilton,* Lima, Lorain, Mansfield, Newark, Springfield, Steubenville; Oklahoma—Enid, Lawton; Pennsylvania—*Altoona,* Erie, Johnstown, Lancaster, Sharon, State College, Williamsport; South Carolina—Anderson, Florence, Rock Hill; Tennessee—Clarksville; Texas—*Abilene,* Amarillo, Bryan, *Galveston,* Longview, Midland, San Angelo, Sherman, Victoria, Waco; Utah—Provo; Virginia—*Danville, Lynchburg;* Washington—Bremerton, Richland; West Virginia—Huntington, Parkersburg, *Wheeling;* Wisconsin—Eau Claire, Janesville, Kenosha, *La Crosse,* Racine, Sheboygan, Wausau.

Table 5. Percentage of counties with no abortion providers and with no providers reporting 400 or more abortions, and percentage of women aged 15–44 living in those counties, by metropolitan status,* 1988

Measure	Total	Metro	Nonmetro
Counties (N=3,135)			
With no provider	83	51	93
With no provider reporting ≥400 abortions	92	67	99
Women 15–44 (N=58,192,000)			
Living in counties with no providers	31	16	83
Living in counties with no provider reporting ≥400 abortions	42	26	97

*Defined according to criteria published by the OMB after the 1980 census.

Abortion Providers

Abortions are performed in hospitals, as inpatient services and in outpatient departments; in nonhospital clinics, including specialized abortion clinics, surgical centers, group practices, health maintenance organizations and other types of clinics; and in private physicians' offices. It is difficult to distinguish between clinics and physicians' offices where large numbers of abortions are performed, and in this analysis all nonhospital facilities reporting 400 or more abortions per year are classified as clinics. Clinics are further subdivided into "abortion clinics" and "other clinics." Abortion clinics are those in which at least 50 percent of patient visits are reported to be for abortion services.*

The number of abortion providers identified in AGI surveys increased throughout the 1970s and reached 2,908 in 1982. It has since fallen steadily to 2,618 in 1987 and 2,582 in 1988, a decline of 11 percent. Providers have always been concentrated in urban areas, but the concentration has become more pronounced in recent years. The number of nonmetropolitan providers is now 51 percent below the peak figure in 1977, while the number of providers in metropolitan counties has dropped only six percent from its peak in 1982. In 1988, 2,315 (90 percent of all providers) were in metropolitan counties, slightly less than the 2,331 (89 percent) in 1987.

The decline in the number of providers has occurred entirely among hospitals. In 1977, there were 1,654 hospitals offering abortion services; the number fell to 1,405 in 1982, to 1,191 in 1985 and to 1,040 in 1988. Because a disproportionate number of the abortion providers in nonmetropolitan areas are hospitals, a decline in the number of these providers especially affects women not living near major cities.

Between 1985 and 1988, 91 new hospital abortion providers were identified, 230 hospitals discontinued their services, and 12 others did not respond to the survey, for a net reduction of 151, or 13 percent, in the number of hospitals that offer abortion services. As shown in Table 6, more than half of the reduction (87) occurred among voluntary nonchurch hospitals. The percentage reduction was greatest among county hospitals (22 percent), those run by hospital district organizations (18 percent) and proprietary hospitals (16 percent).

Of the country's 5,533 short-term general hospitals,[8] only 19 percent provided abortions in 1988, down from 21 percent in 1985 (not shown). Excluding Catholic hospitals,[9] the proportion is 21 percent, down from 23 percent. Private general hospitals offer the service more often than public ones—24 percent (excluding Catholic hospitals) compared with 15 percent.

The number of nonhospital facilities where abortions are performed increased four percent between 1985 and 1988, as shown in Table 6. The number of clinics reporting 400 or more abortions per year rose two percent, with 16 additional facilities. Between 1982 and 1985, the number of clinics this size had increased by 32, or five percent. Because several new group practices are classified as small clinics, the number of clinics performing fewer than 30 abortions annually more than doubled in the most recent period; this size clinic also increased in number between 1982 and 1985. The number of physicians offering abortion services in their offices stayed fairly constant, with a decline in the number performing 30 or more abortions balanced by an increase in those performing fewer than 30.

Since 1973, there has been a major shift in the proportion of abortions performed by hospitals and nonhospital facilities, especially abortion clinics, as Figure 1 (page 108) shows. In 1973, slightly more than half of all abortions were performed in hospitals, compared with 46 percent in clinics. However, the proportion of abortions performed in hospitals has declined steadily to just 10 percent in 1988, while the proportion handled by clinics increased each year, to 86 percent in 1988. This shift reflects reductions both in the number of hospitals performing abortions and in the average number of abortions per hospital (among those that provide the service). The percentage of abortions performed by physicians in their own offices has always been low, representing 3–5 percent of all abortions.

Table 6. Number of abortion providers in 1985 and 1988, and change between 1985 and 1988, by type of facility

Type of facility	1985	1988	Change 1985–1988	
			N	%
Total	**2,680**	**2,582**	**–98**	**–4**
Hospital	**1,191**	**1,040**	**–151**	**–13**
Public	265	230	–35	–13
Federal	0	1	1	*
State	40	39	–1	–3
Hospital district	100	82	–18	–18
County	74	58	–16	–22
City; city/county	51	50	–1	–2
Private	926	810	–116	–13
Voluntary, church	50	48	–2	–4
Voluntary, other	702	615	–87	–12
Proprietary	174	147	–27	–16
Nonhospital facility	**1,489**	**1,542**	**53**	**4**
Clinics	837	885	48	6
<30 abortions	16	33	17	106
30–390 abortions	132	147	15	11
400–990 abortions	228	233	5	2
≥1,000 abortions	461	472	11	2
Physicians' offices	652	657	5	1
<30 abortions	154	181	27	18
30–390 abortions	498	476	–22	–4

*Cannot be calculated.

Hospitals tend to have small abortion caseloads, with 45 percent of the hospital providers reporting fewer than 30 abortions. As Table 7 (page 108) indicates, only 30 hospitals performed 1,000 or more abortions. The average number of abortions per hospital provider fell from 175 in 1985 to 153 in 1988. As has been noted in earlier surveys, hospital abortions are increasingly being performed as outpatient procedures. In 1988, only 14.6 percent of hospital abortions, or 1.5 percent of all abortions, involved hospitalization. In 1985, 2.7 percent of all abortions were performed as hospital inpatient procedures.

Most abortions are performed in specialized abortion clinics; the proportion has increased to 64 percent, up from 60 percent in 1985. The number of abortions performed in abortion clinics grew six percent between 1985 and 1988, while the number in each of the other types of facilities declined. Similarly, the proportion of abortions in the largest facilities, those reporting 1,000 or more procedures, was higher in 1988 (80 percent) than in 1985 (77 percent). Doctors' offices constitute 25 percent of the abortion providers but reported only four percent of all abortions. Thus,

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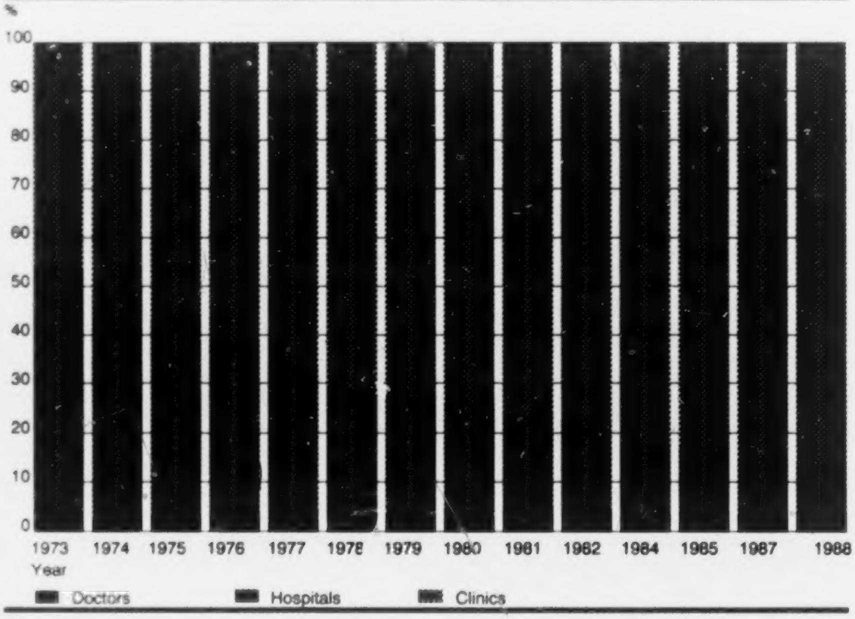
*Clinics that did not provide information about the percentage of patient visits made for abortion were classified as abortion clinics if they reported 1,000 or more abortions during 1988. However, if their self-definition is physician's office (i.e., if they have not adopted a clinic name), the cutoff is 1,500 abortions.

Figure 1. Percentage distribution of abortions, by type of facility and year



abortion services are becoming increasingly concentrated in the largest, most specialized facilities.

Discussion

The annual number of abortions has remained nearly stable since 1980, even though several factors could have affected it in either direction. Although the number of women of reproductive age in the population increased, the age distribution changed: More are over 30 years old, and abortion rates for such women are low. Specifically, the number of women aged 20-24 fell 10 percent between 1980 and 1988.[10] If age-specific abortion rates had remained at their 1980 levels, the number of abortions in 1988 would have been four percent lower than the observed number. Changes in the marital status of the population, on the other hand, should have increased the age-specific abortion rates, since a lower proportion of women in each age-group are now married, and unmarried women are much more likely than married ones to have abortions.[11] In addition, the proportion of unmarried teenagers who are sexually active increased during the 1980s.[12] The direction and extent of these influences and the impact of changes in use of the various contraceptive methods will be better understood when the 1988 National Survey of Family Growth has been analyzed.

Table 7. Number and percentage distribution of abortions and abortion providers by type of facility, according to caseload, 1988

Caseload	Total		Hospitals		Abortion		Other clinics		MD's offices	
	N	%	N	%	N	%	N	%	N	%
Abortions	**1,590,750**	**100**	**159,170**	**10**	**1,015,400**	**64**	**355,020**	**22**	**61,160**	**4**
<30	6,260	*	3,600	*	0	0	370	*	2,290	*
30–390	136,690	9	53,930	3	1,480	*	22,410	1	58,870	4
400–990	182,680	11	33,580	2	38,390	2	110,710	7	na	na
1,000–4,990	948,100	60	50,190	3	676,380	43	221,530	14	na	na
≥5,000	317,020	20	17,870	1	299,150	19	0	0	na	na
Providers	**2,582**	**100**	**1,040**	**40**	**409**	**16**	**476**	**18**	**657**	**25**
<30	678	26	464	18	0	0	33	1	181	7
30–390	1,116	43	493	19	7	*	140	5	476	18
400–990	286	11	53	2	53	2	180	7	na	na
1,000–4,990	459	18	27	1	309	12	123	5	na	na
≥5,000	43	2	3	*	40	2	0	0	na	na

*Fewer than 0.5 percent. Note: na=not applicable.

The basic trends in abortion service delivery that were observed in 1985 have continued through 1988. The concentration of abortion services in specialized abortion clinics has continued to increase as a result of growth in the number of such providers and higher caseloads per provider. Conversely, abortion services in hospitals have been declining as a result of lower caseloads and discontinuation of abortion services altogether. The number of physicians providing small numbers of abortions in their offices has stabilized, but their average caseload is smaller than before.

The shift of abortions from hospitals to clinics is probably due in large part to the cost advantage of clinics, as well as to the increasing ability of clinics to provide abortions at later gestations. In addition, clinics offer other advantages for women: their medical and support staffs understand the problems faced by abortion patients; they have the competence that comes from extensive experience; and they are relatively easy to find, especially if they advertise. However, services provided by physicians in their offices and by hospitals are also needed. Some women prefer the care of their personal physicians, and the continuity such care offers may be advantageous. Hospital services are needed for women with health conditions that put them at high risk for complications, as well as for women requiring concurrent surgery or abortion by instillation procedures.

It is equally important that physician and hospital services be available in sparsely populated areas where it is not economical to establish clinics. The loss of hospital abortion services has left increasing numbers of women without any provider in their local areas. It is surprising, however, that the loss of providers has been limited to hospitals, considering the problems confronting private physicians and clinics; antiabortion harassment and violence have most often been directed at nonhospital providers. In addition, private physicians and clinics may have difficulties in obtaining insurance, paying legal and security expenses, and stretching income based on fees that have not kept up with inflation.[13]

The net decrease in the number of hospitals that perform abortions has had the unfortunate effect of reducing abortion services in states and counties where they were already scarce. Extreme inequality of access to such services already exists, even without new state restrictions that may result from the decision in *Webster* v. *Re-*

(Continued on page 142)

Does Family Interaction Prevent Adolescent Pregnancy?

By Lynne M. Casper

Summary

This study uses data from the 1982 National Survey of Family Growth to ascertain whether family interaction can avert adolescent sexual activity, pregnancy, childbearing and parenthood. The results obtained from using logistic regression procedures indicate that the family may be effective in increasing adolescents' use of contraceptives and selection of abortion or adoption as alternatives to parenthood. Family interaction, however, was not associated with forestalling adolescent sexual activity or with providing for the well-being of the adolescent and her child and it is unlikely that a policy based solely on family interaction will be effective. Characteristics associated with effectiveness in preventing adolescent pregnancy included race, religion, residence, mother's education, the adolescent's age and family income.

> **"Our results indicate that no significant relationship exists between family interaction—as indicated by family proximity—and the probability that an adolescent will have a healthy pregnancy."**

Introduction

Over the past decade, many federal and state policies concerning adolescent childbearing have focused on parental involvement, based on the assumption that family participation can, and should, be the basis for preventing the behaviors related to early pregnancy and childbearing. However, there is a great deal of uncertainty as to whether family interaction can be effective in this area. Furthermore, most of these policies emphasize delaying the age at which adolescents become sexually active and although this approach is important, it does not address all of the problems and decisions surrounding the issue.

In 1987, the National Academy of Sciences (NAS) published a report pointing out that the sexual decision-making process undergone by young women involves a sequence of choices.[1] The adolescent must choose from a limited set of options at each subsequent stage: She must decide whether to have sexual intercourse and whether to remain sexually active; whether to practice contraception and if so, what method to use; should contraception fail, whether to seek an abortion or to carry the pregnancy to term; and if she chooses the latter, whether to give the child up for adoption, marry to legitimate the birth or bring the child up as a single parent. This article uses this contextual framework to investigate how parents might influence the decision-making process and to determine which socioeconomic backgrounds characterize those families who are most effective at preventing the behaviors leading to early pregnancy and childbearing.

Although there has been no concerted effort to study family interaction as it relates specifically to adolescent sexuality and reproduction, research has been conducted in two associated areas—family communication and the physical proximity of parents and children. Most of this research focuses on communication between parents and adolescents and asserts that such communication is essential in transmitting values, attitudes and knowledge.[2] Through this transmission of values from parent to child, adolescents will presumably learn to make informed decisions and to avoid early sexual initiation and parenthood. Consequently, the few programs that are aimed at increasing family participation in adolescent decision-making have focused on promoting effective family communication.

Other research suggests that the physical proximity of parents to adolescents can also be important in the transmission of attitudes, beliefs and knowledge.[3] Studies focusing generally on kinship and friendship networks have found that they affect an individual's definition of, and response to, illnesses or life crises.[4] More specifically, people who belong to strong social networks are more likely to engage in preventive health behavior and to receive more direct psychological support.[5]

Both the degree of parent-child communication concerning sexuality and reproductive decisions and the physical proximity of parents during the adolescent years can be examined to measure actual family interaction or the potential for it. Unfortunately, research examining the direct effect of family interaction on the prevention of adolescent pregnancy is limited and sometimes inconclusive. Research has shown that adolescents who perceive that they have little parental support and do not communicate well with their parents are more likely to be sexually experienced.[6] On the other hand, a higher level of family communication has been associated with a higher level of sexual activity because the child misunderstands the information or attitudes transmitted by the parent. In addition, family communication may have little effect on early initiation of

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Table 1. Logit coefficients (and coefficients/standard errors) describing the effects of background characteristics alone and combined with family interaction on the probability that an adolescent will initiate sexual activity before age 19, by characteristic

Characteristic	Background characteristics alone (N=1,888)	With family interaction (N=1,887)
Constant	0.439 (1.09)	0.453 (1.13)
Communication on how pregnancy occurs†	na	–0.008 (–0.14)
Black race	0.257 (4.21)***	0.257 (4.20)***
Religious affiliation		
Protestant	–0.221 (–1.95)	–0.221 (–1.95)
Catholic	–0.274 (–2.29)*	–0.276 (–2.30)*
Other	–0.022 (–0.12)	–0.021 (–0.12)
Residence		
North Central	0.170 (2.12)*	0.174 (2.15)*
South	0.275 (3.61)***	0.277 (3.62)***
West	0.384 (4.12)***	0.387 (4.14)***
Rural	–0.014 (–0.24)	–0.013 (–0.22)
Father's education	–0.015 (–1.68)***	–0.015 (–1.64)***
Mother's education	–0.050 (–4.44)***	–0.050 (–4.42)***
Adolescent's age	0.318 (15.1)***	0.317 (15.0)***
Family income	–0.001 (–4.18)***	–0.001 (–4.23)***
Income missing	–0.344 (–4.86)***	–0.346 (–4.88)***

*Significant at $p<0.05$. ***Significant at $p<0.001$.

†Sixty-seven percent of the sample had had communication on how pregnancy occurs and 53 percent were sexually active.

Note: na=not applicable.

sexual activity since many adolescents may already be sexually active by the time the communication takes place.[7]

Other research suggests that the content of the communication influences adolescent sexual activity: For adolescent boys, talking with their mothers about sex is associated with less sexual activity, while talking with their fathers is associated with more.[8] The researchers hypothesize that mothers focus on the responsibility of sexual activity, whereas fathers insinuate that sexual activity is acceptable.

Research also indicates that parent-child communication about contraception, especially among mothers and daughters, increases the likelihood that adolescents will use a contraceptive method.[9] Other studies have demonstrated that adolescents whose mothers have a consenting view of abortion are more likely to terminate an unwanted pregnancy than adolescents whose mothers do not.[10]

The physical proximity of adolescents and their parents is associated with positive physical, social and psychological health outcomes for the adolescents and their children, according to other evidence.[11] One study that does not focus strictly on adolescents has shown that, in general, mothers who are socially isolated from spouses, parents and friends are more likely to neglect professional prenatal care.[12] However, another study found that young women living near or with their mothers were no more likely to receive early prenatal care than those who lived far away from their families.[13]

Although the evidence linking parental proximity and communication to the prevention of early sexual initiation and the well-being of the adolescent mother and her child is inconclusive, family interaction does seem to be effective in preventing pregnancy by encouraging contraceptive use, and in preventing adolescent parenthood by encouraging alternatives if an adolescent becomes pregnant. However, virtually none of the research in this area considers how family background characteristics might influence parents to take an active role in their adolescents' sex lives or might determine parent's effectiveness in preventing adolescent pregnancy. Moreover, general research on relationships and communication of values between parents and children indicates that the transmission of values varies by race, class, area of residence, religion and region.[14]

In this article, we examine the effectiveness of family interaction in preventing adolescent pregnancy at the four levels of decision-making set forth by the NAS. These consecutive levels are 1) the initiation of sexual activity; 2) the use of contraceptives once sexually active; 3) the choice, if pregnant, of abortion or adoption; and 4) the well-being of the pregnant adolescent and her baby once a decision has been made to carry to term.

Using the limited data from previous research, one can predict that active participation in the family and proximity to other family members will be positively related to contraceptive use and choosing alternatives to parenthood among teenagers. No predictions can be made, however, with respect to how family interaction affects early sexual initiation or the well-being of the adolescent mother and her child. Also, although it is expected that the effectiveness in preventing adolescent pregnancy will vary among different types of families, no specific predictions can be made concerning which families are the most successful in this regard.

Data and Methodology

Our empirical analysis uses a subset of data from Cycle III of the 1982 National Survey of Family Growth (NSFG), which conducted interviews in the homes of 7,969 respondents. The NSFG used a nationally representative sample of women aged 15–44. The design of the sample is particularly well suited to this analysis because it oversampled blacks and teenagers; further, the data contain very few missing cases for most of the variables and are generally considered to be of very high quality.

Our analysis utilizes the subset of NSFG data on women aged 15–19 only (N=1,888); although adolescent males should ideally be included in this study, no comparable suitable data are available. The data set contains a wide variety of topics relevant to our research, including histories of pregnancy, prenatal care and pregnancy outcomes, menarche, sexual experience, contraceptive use, sterility and subfecundity; birth expectations; visits for family planning services; family background and relationships; and work history.

The samples used to analyze various levels of decision-making include different groups of adolescents because not all adolescents would have reached all the levels at any given time. Each sample, then, contains the population considered to be at risk for the particular event defined for that level. Since every female is at risk of becoming sexually active, the whole sample is included at this level of analysis. At the second level, those who are sexually active were defined as at risk of practicing contraception; therefore, the sample at this level contains only those who have had intercourse (N=945). The population at risk of choosing between alternatives to

Table 2. Logit coefficients (and coefficients/standard errors) describing the effects of background characteristics alone and combined with family interaction on the probability that an adolescent is currently practicing contraception, by characteristic

Characteristic	Background characteristics alone (N=780)	With family interaction (N=780)
Constant	2.85 (4.34)***	2.21 (3.22)***
Communication about contraception†	na	–0.381 (4.71)***
Black race	0.045 (0.51)	0.012 (0.13)
Religious affiliation		
Protestant	0.293 (1.99)*	0.302 (2.02)*
Catholic	0.185 (1.16)	0.200 (1.23)
Other	0.487 (1.73)	0.480 (1.69)
Residence		
North Central	0.054 (0.41)	0.035 (0.27)
South	0.028 (0.24)	0.013 (0.11)
West	0.205 (1.40)	0.164 (1.11)
Rural	–0.066 (–0.77)	–0.078 (–0.89)
Father's education	–0.007 (–0.52)	–0.009 (–0.67)
Mother's education	0.025 (1.48)	0.020 (1.20)
Adolescent's age	0.111 (3.36)**	0.142 (4.11)***
Family income	0.000 (0.331)	0.000 (0.306)
Income missing	–0.062 (–0.62)	–0.066 (–0.65)

*Significant at $p<0.05$. **Significant at $p<0.01$. ***Significant at $p<0.001$.

†Forty percent of the sample had had communication about contraception and 64 percent were using contraception.

Notes: From the original sample of 945 sexually active adolescents, we excluded 165 who were pregnant, seeking pregnancy, postpartum, nonsurgically sterile, younger than age 19 and had experienced intercourse only once, and those who had had no intercourse since menarche, leaving a sample of 780; na=not applicable.

parenthood consists only of those adolescents who were once pregnant (N=298). Finally, the group of adolescents who would have needed care for themselves and their baby consists of those who had had a live birth (N=206). Although the samples for these last two categories are relatively small, we believe that they contribute valuable qualitative findings; even so, we advise caution in interpreting the coefficients associated with these models.

Logistic regressions were performed to evaluate whether family interaction has any effect on the prevention of adolescent pregnancy and on the well-being of adolescent mothers and their children. Two logistic models were considered for each of the four levels of the decision-making process. These two models serve different purposes and should be interpreted separately. The first model measured only the effect of family background at each level of decision-making (without family interaction); the second incorporated all of the independent variables of the first, in addition to a variable indicating family interaction. This approach can determine whether family interaction is effective, and if so, for which types of families. If interaction proves to be ineffective, the coefficients from the first model may still be used to ascertain which families are at the greatest risk of experiencing the consequences of adolescent pregnancy and thus may be targeted by other approaches.

We designated four dichotomous dependent variables, each corresponding to the appropriate level of decision-making, that measured the presence or absence of the following: the initiation of sexual activity during adolescence (before age 19); contraceptive use; choosing an alternative to parenthood (adoption or abortion); and early prenatal care (indicating the well-being of the adolescent and her child).*

Several family background and personal factors may influence adolescent sexual activity and consequent behavior. We selected as independent variables a set of socioeconomic indicators (father's education, mother's education and family income) and a set of sociodemographic indicators (race, region of residence, religion and rural vs. urban residence). Age is the one characteristic used in these models that pertains solely to the adolescent herself.†

The variables measuring parental education are continuous and range from zero (for no formal schooling) to 18 (for 18 or more years). Family income was coded as interval level data using the midpoints of several income categories. The race variable was dichotomized with white being the omitted category and black and those of other races set equal to one. We used four categories of affiliation for the first three levels of decision-making: Protestant, Catholic, other and no affiliation. For the last level, those who specified no religious affiliation were combined with the "other" category. Four variables were created for region of residence: North Central, South, West and Northeast. Rural vs. urban residence is represented by a dichotomous variable with rural coded as one and urban as zero. The last category named in each case is the omitted category.

In the second logistic model, family interaction is incorporated as a dichotomous independent variable measuring the presence (coded as one) or absence (coded as zero) at the appropriate level of decision-making of the following: parent-adolescent communication about how pregnancy occurs; parent-adolescent communication about contraception; coresidence with at least one parent during pregnancy; and coresidence with at least one parent after the birth of the adolescent's first child.

Our choice of indicators of family interaction was guided in part by previous research and in part by data available from the NSFG. For the first level of decision-making, research has shown that dissemination of information regarding sexuality and assertiveness training may be associated with a delay in the initiation of sexual activity.[15] Thus, we used a measure related to the dissemination of information on sexuality—parent-adolescent communication about how pregnancy occurs.

For the second level of decision-making, family interaction associated with the use of contraceptives is measured directly: Adolescents reported whether or not they had ever communicated with their parents

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*There were many possible available indicators that measure positive physical and mental prenatal and postnatal health outcomes for both the baby and the adolescent mother. Most of them, however, did not have sufficient variability within them to warrant their use. One reason for this could be that the government provides substantial support at this decision-making level through such programs as Women Infants and Children, Aid to Families with Dependent Children and Foodstamps. Federal agencies have used a wide variety of measures denoting healthy outcomes for babies, including early prenatal care (i.e., within the first trimester).

†The age variable is a time-varying covariate and therefore somewhat more complex than the other variables in the analysis. Since age has different substantive implications for each level of decision-making and might not correspond to age at the date of the survey, separate indicators were chosen for some of the levels. In the models for the first two levels of decision-making, age at the time of the survey was used. Age at conception was used for the third level; age at first birth was used for the fourth.

Table 3. Logit coefficients (and coefficients/standard errors) describing the effects of background characteristics alone and combined with family interaction on the probability than an adolescent will choose abortion or adoption as an alternative to parenthood, by characteristic

Characteristic	Background characteristics alone (N=298)	With family interaction (N=294)
Constant	6.16 (6.60)***	5.42 (5.51)***
Adolescent lived with parent(s) during pregnancy†	na	0.536 (2.47)*
Black race	–0.467 (–2.79)*	–0.504 (–2.96)**
Religious affiliation		
Protestant	–0.677 (–3.04)**	–0.673 (–2.97)**
Catholic	–0.510 (–2.01)*	–0.477 (–1.83)
Other	0.857 (1.36)	0.862 (1.39)
Residence		
North Central	–0.346 (–1.43)	–0.368 (–1.49)
South	–0.386 (–1.74)	–0.361 (–1.60)
West	–0.540 (–2.02)*	–0.411 (–1.50)
Rural	0.097 (0.59)	0.078 (0.46)
Father's education	0.024 (0.90)	0.023 (0.87)
Mother's education	0.077 (2.26)*	0.072 (2.09)*
Adolescent's age	–0.123 (–2.36)**	–0.100 (–1.83)
Family income	0.001 (2.00)*	0.001 (1.51)
Income missing	0.254 (1.34)	0.181 (0.94)

*Significant at $p<0.05$. **Significant at $p<0.01$. ***Significant at $p<0.001$.

†Seventy-five percent of the sample lived with parent(s) during pregnancy and 31 percent elected an alternative to parenthood.

Notes: Sample includes only first pregnancies; na=not applicable.

about using a method of contraception.

For the third and fourth levels of decision-making, there were no direct questions in the NSFG regarding communication about abortion and adoption or prenatal care. Ethnographic research has shown, however, that access to kin is an essential component of family support networks. In particular, nearby or coresidential kin may provide daily support and advice to pregnant mothers, insofar as distance is a key determinant of certain types of support requiring personal interaction.[16] Therefore, we used coresidence with parents as a proxy for family interaction in the areas of alternatives to childbearing and the well-being of the adolescent and her child.

Because of a large number of missing cases for the income variable (N=612), a new independent variable was created to ascertain whether those who did not respond to this question behaved any differently from those who did. This variable was entered into the model as dichotomous, with those adolescents not reporting income coded as one and those reporting a valid income as zero. For the general family income variable, those adolescents who reported no family income were assigned the mean family income level for that particular subsample.

Results

In each of the following tables, the results of the first model are given in column 1 and those for the second, in column 2. Where the effect of family interaction at a decision-making level is not significant, we focus on the effects of the individual background characteristics alone.

Table 1 (page 110) presents the effects of family interaction on the probability of early sexual initiation. The results indicate that parent-adolescent communication regarding how pregnancy occurs is not related to the probability that an adolescent will abstain from sexual intercourse until the age of 19. Thus, there is no evidence that a policy based solely on family participation would achieve the intended result of delaying the initiation of sexual activity; simply informing adolescents about the potential risks associated with becoming sexually active does not mean that they will avoid sexual activity.

The results in the first column indicate that race, religious affiliation, residence, mother's education, age of the adolescent and family income are all significantly related to the probability of being sexually active during adolescence. On average, black adolescents are more apt to be sexually experienced than white adolescents, even when other factors are controlled for, a finding supported by other research.[17] Catholic adolescent women are significantly less likely to be sexually active than Protestants, those expressing no religious affiliation or those of other religions. Here, our findings contradict a study that found that although strength of religious conviction made a difference, religious affiliation per se was not significantly related to the probability that an adolescent would be sexually active.[18] Also, adolescents residing in the Northeast are less likely to be sexually active than those living in the South, the West or the North Central region. Further, the magnitude of the coefficients suggests that adolescents from the West are the most likely to be sexually active, followed by those from the South and those from the North Central region.

Two of the socioeconomic indicators—mothers' education and family income—have a significant effect on predicting teenage sexual activity; both are negatively related to the probability that an adolescent will initiate sexual activity. Specifically, adolescents of a lower socioeconomic status are more likely to be sexually active than those of a higher socioeconomic status, even when all other background variables are controlled for. Compared with adolescents who reported family income, those who did not were significantly less likely to be sexually active. It would seem, then, that those adolescents who refused to report their family income behave more like adolescents from a higher socioeconomic status.

Age was found to be positively related to the probability of being sexually active, consistent with the results of a previous study.[19] In general, the older the adolescent, the more likely that she will be sexually active.

Table 2 (page 111) presents the effects of family interaction on the probability of contraceptive use. Unlike the findings on early sexual initiation, the results displayed in column 2 suggest that a policy based on family participation to influence contraceptive use may hold promise. As we hypothesized, family interaction in the form of communication about birth control significantly influences the use of contraceptives ($p<0.001$).

Thus, this evidence can be used to identify the families for whom communication is most likely to be effective. Only religion and age have a significant influence on predicting contraceptive use. The effect of age is as expected: Older adolescents are more likely to practice contraception than are younger adolescents, a finding consistent with other research.[20] One explanation could be that younger adolescents are less informed; it is also possible that they simply do not understand the information that is given to them.

In contrast to results of another study that found no relationship between contraceptive use and religion,[21] our results imply that religious affiliation can be used to some extent to indicate which adolescents are more likely to practice contraception. Contraceptive use is more likely among Protestant adolescents than Catholics, adolescents of other religions or those not expressing any religious affiliation.

The third level of decision-making (Table 3) involves acceptance of an alternative to parenting once pregnant. As we hypothesized, living with a parent or parents at the time of conception—used as a proxy for family interaction—is significantly related to the probability of choosing adoption or abortion over parenthood ($p<0.05$). The evidence suggests that a policy incorporating family interaction on this decision-making level also seems promising in the long run.

The logit coefficients presented in Table 3 indicate that several factors are useful in predicting which families are likely to influence their adolescent daughter to choose an alternative to parenthood. The probability varies by race and religion. Our results show that blacks are less likely to choose abortion or adoption than whites, supporting the results of other studies.[22] Protestants are also less likely to choose an alternative to childrearing than Catholics, those of another religion or those expressing no religious affiliation, a finding also reported in a previous study.[23]

Socioeconomic status is also of some use in identifying those adolescents who choose an alternative to parenting. Our results indicate that all else being equal, adolescents who come from families of higher economic and educational status are more likely to put their children up for adoption or to obtain an abortion than are adolescents of lower socioeconomic status; again, this finding is consistent with previously published research.[24]

On the fourth level of decision-making (Table 4), our results indicate that no significant relationship exists between family interaction—as indicated by family proximity—and the probability that an adolescent will have a healthy pregnancy. Although the sample size is small and caution must be exercised when interpreting results, the data imply that an adolescent residing with her family before giving birth is no more likely than an adolescent who has other living arrangements to receive prenatal care in the first trimester. This finding supports the results reported in one study,[25] but contradicts those published in another.[26]

Table 4. Logit coefficients (and coefficients/standard errors) describing the effects of background characteristics alone and combined with family interaction on the probability that an adolescent will seek early prenatal care (within the first trimester), by characteristic

Characteristic	Background characteristics alone (N=206)	With family interaction (N=206)
Constant	7.67 (5.78)***	7.17 (5.06)***
Adolescent lived with parent(s) during pregnancy†	na	0.201 (0.867)
Black race	–0.091 (–0.45)	–0.154 (–0.72)
Religious affiliation		
Protestant	–0.206 (–0.71)	–0.133 (–0.44)
Catholic	–0.648 (–1.76)	–0.656 (–1.70)
Residence		
North Central	–0.529 (–1.34)	–0.672 (–1.64)
South	0.180 (0.56)	0.194 (0.60)
West	0.342 (0.93)	0.336 (0.90)
Rural	–0.145 (–0.75)	–0.166 (–0.84)
Father's education	–0.008 (–0.29)	–0.001 (–0.04)
Mother's education	–0.009 (–0.26)	–0.012 (–0.31)
Adolescent's age	–0.151 (–2.18)*	–0.134 (–1.85)
Family income	–0.001 (–0.71)	–0.001 (–0.70)
Income missing	–0.276 (–1.18)	–0.248 (–1.04)

*Significant at $p<0.05$. ***Significant at $p<0.001$.

†Seventy-three percent of the sample lived with parent(s) during pregnancy and 74 percent sought early prenatal care.

Notes: Sample includes only first births that occurred before age 20; 24 observations are missing from column 1 and 26 are missing from column 2; na=not applicable.

Unfortunately, the logistic regressions at this level do not provide much useful information for identifying adolescents who will seek prenatal care. This may be due in part to the small sample size. The data in the first column of Table 4, however, indicate that only one variable—age—is significantly related to the probability that a teenager will receive adequate prenatal care. Contrary to what one might expect, older adolescents are less likely to obtain early prenatal care than are younger adolescents. Although we have no concrete explanation for this finding, we speculate that older adolescents are not as likely to be in school and, therefore, may not have access to institutions that provide health care and counseling. Other studies have found a positive relationship between socioeconomic status and the use of prenatal care,[27] but our data do not reveal any evidence of this relationship.

Conclusions

In this article, we have argued that a policy centered only on preventing adolescent sexual activity is insufficient. Federal and state policies designed to reduce adolescent pregnancy and childbearing would be improved if they focused on more than just the first behavior involved in the causal chain of events linking sexual activity to pregnancy and parenthood. The broad policy objectives of the past two administrations have focused on some form of family participation, despite the fact that there is no clear evidence that family participation can be effective.

Our results indicate that family interaction is potentially influential in reducing adolescent pregnancy at certain stages of decision-making. They show that the family is effective in encouraging sexually active girls to use contraceptives. Family interaction could also be said to be instrumental in persuading pregnant adolescents to elect an alternative to parenthood. There are, however, many adolescent women who do not live with their families. These adolescents would be unlikely to have close relationships with their families or at least to interact with them frequently and thus benefit from their advice. Thus, policy not based on family participation could be created to assist these adolescents in making informed desicions. Our data, however, fail to support the premise that families are effective at curbing the initiation of sexual activity among adolescent girls or that living with at least one parent improves the prospects that an adolescent will seek early prenatal care. The results imply that some families do not interact effectively, and that others may not interact at all. Alternative programs that help adolescents make informed decisions might enable those belonging to such families to avoid pregnancy also.

Our findings about the second and third levels of decision-making suggest the potential effectiveness of family participation. Alternative programs and policies for those families who are not actively participating in adolescent decision-making could increase the probability of resolving the problems of adolescent pregnancy.

There are several weaknesses in the study that should be addressed. Some of the variables used to indicate family participation and outcomes were indirect or proxy measures. Data limitations prevented analyses that would have been more suitable. Our recommendations for future research would therefore include the direct measurement of these variables. For example, it is not known whether parent-child communication regarding contraceptive practice precedes its use; it could be that an adolescent's use of contraceptives affects parent-child communication. It would be desirable to use a measure of communication occurring prior to the onset of contraceptive use. Because previous research indicates the importance of the content of the communication, attempts should also be made to ascertain the specific topics of conversation. For a better indicator of family interaction regarding the decision to become a parent once pregnant, adolescents might be asked whether they discussed alternatives to childrearing with their parents and if so, what the parents' advice was. Similar questions might be asked in regard to prenatal care.

Despite these weaknesses, we feel our results warrant the conclusions and suggestions made and can be used to identify those families for whom participation is not likely to be as effective and for whom alternative policies might be created. In addition, there is no evidence that family interaction will forestall adolescent sexual activity or will contribute to the well-being of the adolescent and her child once parenthood has occurred. Alternative programs need to be considered here, as well as supportive programs in those areas in which parents do have an effect on adolescent behavior.

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Correction

In "Induced Abortion: A World Review, 1990," by Stanley K. Henshaw [22:76, 1990], Table 1 has inaccurate footnote symbols for four countries. In India, abortions are permitted during the first 20 weeks; reasons include juridical grounds, such as rape or incest, and genetic defects. The footnotes should have indicated that in Bulgaria abortions were permitted during the first 10 weeks; since the article was written, the law has been changed to permit first-trimester abortions on request. In Turkey, abortions are permitted during the first 10 weeks. In France, they are permitted during the first 12 weeks.

Reproductive Health Counseling For Young Men: What Does It Do?

By Ross Danielson, Shirley Marcy, Anne Plunkett, William Wiest and Merwyn R. Greenlick

Summary

A reproductive health intervention combining a highly explicit half-hour slide-tape program with a personal health consultation was provided to male patients aged 15–18 at a large health maintenance organization. A test of the consultation's impact against a control group provides no support for the argument that highly explicit instruction in contraception encourages early initiation of intercourse. In fact, the consultation may have reduced pressure to become sexually active among young men who had never had sexual intercourse. There is also some evidence that the consultation helped improve the effectiveness of contraceptive practice among the men who were sexually active at follow-up; those exposed to the consultation were more likely than those who were not to report that their last intercourse was protected by the pill and that their main method of contraception in the previous year was the pill. Compared with those in the control group, patients who received the health consultation scored higher on measures of fertility knowledge and knowledge of the prevention of sexually transmitted diseases, including AIDS. Furthermore, the young men who had the consultation were more likely to have practiced testicular self-examination. In many cases, however, the positive effects of the consultation were stronger or were only statistically significant among those who had not been sexually active at the time of the baseline survey.

"The intervention's positive impact on the young men's confidence in the safety of oral contraceptives may provide critical support for . . . use of a method that may sometimes be discontinued because of the male partner's opposition."

Introduction

Men are increasingly viewed as important targets for services in family planning and prevention of sexually transmitted diseases (STDs),[1] but it is clear that considerably more attention could be given to young men, particularly in the context of routine primary care. Because health care practitioners are highly credible sources of sexual information,* their increased attention to young men could have important results. However, no studies have evaluated the benefits that such an approach might have for young men or for their partners. Therefore, this article will present analyses in a population of young men of the effects of a model health consultation that incorporated instruction to improve contraceptive practice, knowledge of fertility, prevention of STDs, practice of testicular self-examination and amelioration of coercive sexual attitudes.

An earlier study conducted in the same environment concluded that routine medical visits, as well as negative pregnancy tests, were excellent opportunities for the screening and referral of young women for contraceptive counseling.[2] Furthermore, a "developmental" counseling approach that considered the psychosocial characteristics of adolescence was found more effective than a traditional approach (one that emphasized medical history and information on contraceptive options) in achieving long-term compliance in contraceptive consultation. The developmental approach was, additionally, adapted in the present study to emphasize highly explicit, directive advice.[3]

The current research literature provides indirect support for expecting that counseling young men may have positive results. Research on sex education in the schools suggests that it will increase knowledge and change attitudes, although effects on actual contraceptive behavior have not been fully demonstrated.[4] Research outside the traditional sex education context offers more optimistic expectations for affecting contraceptive and sex-

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*In the control group of the study reported here, despite the fact that only eight percent of the respondents reported ever having received sexual information from a nurse and just 21 percent from a physician, a comparison of 11 categories of persons who might serve as a source of such information revealed that our subjects gave physicians the highest rating as a good source, followed by nurses.

ual behavior; for example, direct outreach and the community distribution of condoms may be effective in changing the contraceptive practices of young men.[5] In addition, recent national survey data showing increased condom use by U.S. male adolescents confirm that men's contraceptive practice can be influenced, but it remains unclear what precise factors promote such change.[6]

Much attention has been given recently to the concern that sex education may encourage sexual initiation. One study found such an effect in early adolescence but not in middle or late adolescence;[7] another found that sex education may promote a more accepting attitude toward the sexual practices of others, but it is not at all clear that this leads to early sexual experience.[8] We do not know of any research that has addressed the hypothesis (implicit in many popular beliefs) that explicitness in sexual instruction has permissive consequences. The highly explicit nature of the photography and instruction in the reproductive health consultation tested here provides a chance to study this hypothesis.

A full review of the factors found to be associated with precocious male sexual intercourse (hormone levels, peer context and opportunity characteristics, for example)[9] is beyond the scope of this introduction. We do, however, control for some of these factors in our data analysis.

Data from various studies of women confirm that men play an important role in contraception. One study of college women found that the male partner strongly influenced contraceptive practice and that this influence was greater among couples with stronger relationships.[10] Another study of college women found that coitus-dependent contraceptives were used more reliably when the woman initiated intercourse than when the male partner did, leading the researchers to conclude that improving the contraceptive practice of men might increase the use of coitus-dependent contraception.[11] Several studies have noted that among teenage women who have only recently begun having intercourse, the so-called male methods (the condom and withdrawal) are the most frequently used.[12] Such evidence suggests that the male partner may also exert a substantial influence in the earliest period of a woman's contraceptive career.

Female passivity has been viewed as detrimental to effective contraceptive practice, but the negative consequences of female passivity would seem partly dependent on its relationship to aggressive male sexuality. Indeed, a recent analysis of data from three national surveys suggests that coercive sexual behavior may be an important factor in the very early initiation of intercourse and in poor contraceptive use.[13] We hypothesize that coercive attitudes may be reduced by the promotion of couple communication, by practice in communication about sexual matters, by self-confidence derived from greater knowledge and by cross-gender empathy derived from improved male understanding of female anatomy, sexuality and health concerns.

Our general working hypothesis is that factors found important in female-centered studies of contraception are probably important to men as well.[14] Although these factors will not be reviewed here, we seek to control for some of them in our analysis.

For a number of reasons, we also included information on testicular self-examination in the consultation. Testicular self-examination has been convincingly recommended as a means of early detection of testicular cancer in young men,[15] but such instruction is not widely practiced in medical settings, nor are there reports in the literature of the efficacy of including testicular self-examination instruction along with other reproductive health topics.

Methodology

Our study employed a classical before-after experimental design, with subjects randomized into two groups, to test the efficacy of the reproductive health consultation. Nearly 1,200 young men participated in the experiment, which was conducted within the membership and facilities of the Portland, Oregon, and Vancouver, Washington, service areas of Northwest Region Kaiser Permanente, a health maintenance organization (HMO) serving more than 300,000 members.

Participants were recruited by phone from among young men aged 15–18 who had ambulatory care at participating medical offices during the 18-month recruitment period (from June 1985 to November 1986). The families of 94 percent of 2,602 potential participants were reached by phone (2,444); in 209 cases parents refused consent, in 499 instances the teenagers themselves refused to participate and in 387 cases neither direct refusal nor full consent was received. Among the 100 parents whose reasons for refusal were recorded, 64 said they were "not interested" and 28 said their son was too busy; only a handful explicitly objected to the sexual material. (Although opposition to sexual aspects of the study was infrequent, general expressions of disinterest may have included reaction to the sexual material, since the topics to be covered were described in the recruitment process.) Sixty-eight percent of the teenagers who gave a reason for their refusal indicated nonspecific lack of interest, 22 percent were "too busy" and the remaining 10 percent gave diverse other reasons; none directly objected to the nature of the material. A total of 1,449 volunteered to participate, and scheduling was successfully completed for 1,195. Potential participants were informed that at the end of the study each would receive a travel allowance of $15 to acknowledge the costs of participation.

No data are immediately available to compare participants and nonparticipants. However, we can compare some characteristics of the study participants with those of 6,375 respondents to a mail survey conducted among young teenage Kaiser Permanente members in 1988–1989 in an unrelated study supported by the National Cancer Institute.* Approximately 50 percent of the youths responded to the comparison mail survey. Differences between the two study groups by parental education and employment were small, suggesting either that the bias of nonparticipation is similar in both studies or that the bias in both cases is small.

Data from the study reported here indicate that less than five percent of the young men who participated were black and fewer than four percent were Asian (an estimated one-third of these were Vietnamese). Eighty-six percent of participants reported having a father who was employed full-time; 44 percent reported that their father had graduated from a four-year college. At the beginning, 18 percent of the young men who participated in the reproductive health consultation were high school freshmen, 34 percent were sophomores, 24 percent were juniors and 24 percent were seniors; by follow-up, 13 percent had graduated but had not gone on to college, while 11 percent had graduated and were in college.

Two instruments were used to collect self-reported data from the subjects—the baseline questionnaire, administered upon entry into the study, and the follow-up questionnaire, administered approximately one year later. Participants completed the questionnaires in medical office examining rooms or in similar private rooms provided for this purpose. Strict confidentiality was assured to subjects at recruitment, with the promise that no one (including the researchers) would see responses together with a subject's name.

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*The "Teens Say" Project (A. Biglan, R. Danielson and D. Ary, investigators), is one of five projects in a larger research project ("Tobacco Reduction and Cancer Control") being conducted by T. Vogt and E. Lichtenstein through a grant from the National Cancer Institute.

Participants were randomly assigned to intervention or control categories after completing the baseline questionnaire; random assignment was approximated within each of the seven participating medical offices by alternating assignment to the two groups. None of the participants knew that they had been assigned to these groups: At recruitment, all were told they would be offered the reproductive health consultation, but the members of the control group were not scheduled for the consultation until after they had completed the follow-up questionnaire.* Eighty-five percent of the members of the intervention group were successfully scheduled for a health consultation.

None of the personnel who administered questionnaires to the subjects knew to which group participants had been assigned. Although the personnel who contacted people to schedule the follow-up questionnaire knew the status of the participants, they were instructed not to discuss scheduling for the consultation with members of the control group.

Follow-up questionnaires were completed by 82 percent of the participants. Twenty-three of the 994 completed questionnaires could not be linked to a corresponding baseline questionnaire, leaving 971 subjects with complete data. Attrition was significantly associated with a number of baseline characteristics, and after multivariate adjustment in a logistic regression model, the following characteristics remained associated: having had sexual intercourse in the baseline year, performing poorly in school, being in a higher grade in school, having less perceived family wealth, not having a father in the home, having friends who have had sex, having a girlfriend and having a low level of heterosexual intimacy. With the exception of grade in school, the complements to these variables seem plausible factors for self-selection into the study.

The overall follow-up rates (83 percent and 82 percent in the intervention and control groups, respectively) are both high enough to assure that differences in dropout rates would not have had a large confounding influence. A high follow-up rate is not unusual for studies conducted in the HMO context, where there is a continuity of membership and positive identification with the HMO. Efforts were made to encourage continued participation among subjects who lost HMO membership. Since the study was largely restricted to sophomores and juniors, the study population was more stable than if it had included large numbers of high school seniors (who were accepted into the study only if they anticipated remaining in the area for one year). Participants who moved out of the region or could not be contacted for follow-up provided the two most common reasons for attrition. A small number of participants who had moved from the region and felt confident that they could complete the form in privacy returned the follow-up questionnaire by mail.

We used logistic regression to control for the potential confounding effects of a range of variables.† Data for all subjects for whom relevant information was available were examined separately by whether or not members of the two study groups were sexually active in the baseline year. For simplicity, we will generally control for a common set of variables in all tests of intervention effects, except that contraceptive characteristics at baseline are excluded in analyses of youths who were not sexually active at baseline.

Missing values of confounding variables were all replaced by estimated values, usually the mode or median. The response rate for each item was greater than 95 percent for all predictor variables except for parental employment status and parental education; thus, the estimation of missing values does not pose a significant challenge to the validity of our analyses. Cases in which the value of a dependent variable was missing were excluded (except for sexual activity status, which is assumed to be "not active in the previous year" when other data do not indicate intercourse experience).

Statistical significance is noted in terms of p values (corresponding to a two-tailed test of significance), and "statistically significant" denotes findings where $p \leq 0.05$. The large number of control variables renders the estimation of significant effects somewhat conservative, inasmuch as a smaller subset of variables may yield lower p values. The impact of the intervention is indicated by an odds ratio of the target effect in intervention and control groups, adjusted in a logistic regression model to control for the effects of the confounding variables taken into consideration.

The Intervention

The reproductive health consultation used in our research took place during a one-hour medical appointment, with the consultation evenly divided between the viewing of a slide-tape program and a visit with a health care practitioner. Four important criteria guided the design of the model consultation: We hoped to promote abstinence and contraception, serve subjects who were sexually inactive as well as those who were active, appeal both to the youths and to their parents and administer the consultation in a way that did not label subjects as being sexually active or having a sexual problem. We considered that these criteria could be best achieved if a session embraced a broad set of reproductive health concerns rather than focusing exclusively on contraception and abstinence.

Thus, we adapted two existing slide-tape programs to create a program with broad informational objectives that would serve as an introduction to the visit with the practitioner. The half-hour slide-tape program featured explicit photographs of and information on reproductive anatomy, fertility, hernia, testicular self-examination, STDs (including AIDS), contraception (including abstinence), couple communication and access to health services. After a brief introduction by the practitioner, the

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*Subjects were told at the time of recruitment that the scheduling of the consultation could not be forecast and might occur 12 months or more after they had completed the baseline questionnaire.

†Besides participation in the intervention, the following variables were used in the logistic regression analyses conducted in this study: characteristics at baseline—age, religiosity, family wealth, presence of a father, paternal employment, maternal employment, discussion of birth control with parent, evaluation of personal appearance, popularity with others, general health, use of the central clinic, grade in school, school performance, receipt of sex education in school, age of friends, respondents' substance use, peers' substance use, friends' sexual behavior, sexual standards for men, sexual standards for women, attitude toward own premarital sexual intercourse, attitude toward prospective wife's premarital sexual intercourse, precocious maturity, frequency of wet dreams, frequency of masturbation, extent of heterosexual intimacy, having a girlfriend and experience of sexual intercourse; characteristics at baseline in the year preceding the survey (only among sexually active subjects)—partner's pill use, condom use, contraceptive use at last intercourse, frequency of contraceptive use, whether the pill was method used most recently and whether the pill was the main method used; and characteristics at follow-up—parents' highest education, socioeconomic class of neighborhood, receipt of sex education in school between baseline and follow-up, school disobedience, behavior and use of seat belts. Nonresponse was less than five percent for all items except paternal and maternal employment, in which it was between five percent and eight percent. (Interested readers may obtain from the first author complete descriptions of all variables used in the analysis.)

Table 1. Among adolescent males who were sexually active at baseline, percentage distribution, by method used at most recent intercourse at baseline, according to study group, Northwest Region Kaiser Permanente, 1985–1986

Method	Total (N=356)	Intervention (N=187)	Control (N=169)
Pill	15.2	14.4	16.0
Condom	37.9	39.0	36.7
Other	7.6	7.5	7.7
None	39.3	39.1	39.6
Total	100.0	100.0	100.0

patient viewed the program privately in an examination room at the beginning of his scheduled appointment.

The consultation that immediately followed the slide-tape program focused on contraception and was guided by the patient's expressed interests. The approach emphasized establishing a nonjudgmental, professional rapport; commending the patient for scheduling and attending the consultation; offering to answer the patient's questions and concerns; discussing sexuality, fertility goals and reproductive health risks in highly concrete and personal terms; posing appropriate questions to elicit details of context, values and motivation; modeling and rehearsing language for talking with a girlfriend about sexual and contraceptive matters; and providing explicit, highly directive advice. In addition, the practitioner sought to use dialogue as an opportunity to support abstinence, consistency in contraceptive use, the use of back-up methods, prediction of fertility, condom use, recognition of STD symptoms, and appropriate use of health care resources.

Samples of condoms and other birth control devices and materials were used as references during the consultation. The reference to samples, together with other elements of the approach, was intended to increase the patient's comfort level with sexual and contraceptive topics, which might in turn facilitate communication with partners and support greater mindfulness in sexual behavior. The practitioners who were trained to provide the consultation consisted of five nurse practitioners, three physician's assistants and two registered nurses.[*]

We evaluate the effects of the intervention on two aspects of young males' sexual experience at follow-up: their sexual activity status at that time and the "sexual impatience" (i.e., negative or uncomfortable feelings about having never engaged in intercourse) of youths who had never had intercourse. Subjects were considered to have been sexually active if they gave a positive response to one of three questions about sexual activity in the previous year: "In the last 12 months, how many times have you had intercourse?" "With how many girls have you had intercourse during the last 12 months?" and "In the last 12 months, how many times have you had intercourse with someone you didn't know very well?" All other subjects, including those who did not respond to any of these items, were considered sexually inactive.

Findings

Overall, 37 percent of the subjects who completed follow-up were sexually active in the year prior to the baseline survey, and 53 percent were active in the following year. Thirty-one percent of those who had not been sexually active at baseline were sexually active at the time of follow-up, while 90 percent of those who had been sexually active at baseline were also sexually active at follow-up. The study methods offered little incentive for underreporting of sexual experience; young men may, to the contrary, overreport sexual activity. However, we believe that both the assurance of anonymity and the effect of the intervention itself would reduce both tendencies.

There was little difference in sexual activity status between the intervention and control subjects: The proportion of young men sexually active at baseline who were also sexually active at follow-up was 90 percent in the intervention group and 91 percent in the control group; similarly, the proportions of teenage males not sexually active at baseline who became sexually active in the following year were 30 percent and 34 percent, respectively. Thus, the data fail to provide evidence of any statistically significant effects of the intervention on sexual activity status at follow-up, supporting neither the argument that the consultation would encourage abstinence nor the argument that it would encourage sexual activity.

The follow-up questionnaire asked nonrespondents who had never been sexually active how they felt about never having had intercourse. They were asked to indicate one of four levels of agreement or disagreement with the statements "I'm not in a hurry to have sex," "I sometimes don't like being a virgin" and "I'm a little jealous of guys who have." Responses were coded to be positive in the impatient direction for each item, and the average of the three items was calculated. (Inter-item correlations ranged from 0.33 to 0.50, suggesting that the items measured a common attribute.) This average was then collapsed into seven ranks to yield a sexual impatience score with approximately equal numbers of subjects in each rank. A structural validity check showed the measure of sexual impatience to be associated with whether the respondent said he would have unprotected intercourse in a hypothetical dating situation. Indeed, for the virgins, among all of the variables considered in a logistic regression analysis, sexual impatience was the strongest indicator of intention to have unprotected intercourse (an odds ratio of 1.39, $p<0.001$). In an examination of the intervention and sexual impatience, we found an inverse effect: Those exposed to the intervention were less sexually impatient than the controls (an odds ratio of 0.64, $p<0.01$). We conclude that the intervention probably reduced sexual impatience among those who were not yet sexually active.

Contraceptive practice was measured by a variety of items asked at baseline and at follow-up, such as the method or methods ever used in the previous year, the perceived relative frequency of birth control use, the main method used in the previous year and the method used at most recent intercourse.[†] Statistically significant associations with the intervention were found only for the last two of these measures, which were simple open-ended questions.

The main methods used and the method of contraception used at most recent intercourse may be summarized in three major categories—pill, condom and nothing—and one minor category of all other methods (primarily withdrawal and "sex at safe times").[‡] The array of methods used is thus easily recast into four categories corresponding to levels of contraceptive effectiveness—no method, methods less effective than the condom, the condom alone and methods more effective than the con-

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[*] In this analysis, we have not attempted to compare the outcomes for different practitioners; a number of additional variables would also have to be controlled for—especially office location and time of year—to guard against spurious conclusions.

[†] Consistency in responses suggests that the data are reliable. All of those who said that the pill was their main method or the method they had used most recently also reported that their partner had used the pill in the past year. Similar consistency was found in the reporting of condom use (96 percent).

[‡] Although "other" methods do not figure very prominently as either the main method or as the method last used, they are nonetheless important in the young men's contraceptive repertoire, especially the methods of withdrawal and "having sex at safe times." Thirty-seven percent of sexually active subjects reported having used these methods at least once in the year between the baseline and follow-up surveys.

Table 2. Among adolescent males who were sexually active at follow-up, percentage distribution, by method used at most recent intercourse at follow-up, according to sexual activity status at baseline and to study group

Method	All			Active at baseline			Not active at baseline		
	Total (N= 522)	Intervention (N= 262)	Control (N= 260)	Total (N= 317)	Intervention (N= 187)	Control (N= 169)	Total (N= 205)	Intervention (N= 95)	Control (N= 110)
Pill*	28.2	32.4	23.9	30.3	32.3	28.0	24.9	32.6	18.2
Condom	34.7	33.6	35.8	30.6	29.9	31.3	41.0	40.0	41.8
Other	5.0	3.8	6.2	4.4	3.6	5.3	5.9	4.2	7.3
None	32.2	30.1	34.2	34.7	34.1	35.3	28.3	23.2	32.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

*Includes three respondents whose partner had not used the pill but who had used a method more effective than the condom alone; two combined the condom and foam and one reported tubal litigation.

dom alone. (The latter category consisted essentially of participants whose partner had used the pill, except at follow-up, when two respondents reported combined use of the condom and foam and one reported that his partner had had a tubal ligation.) Some respondents said that they had practiced contraception at last intercourse but did not indicate what method was used. In such cases, their main method, if specified, was considered the last method used.

Distributions of methods used at most recent intercourse are shown in Tables 1 and 2 for the baseline and follow-up surveys, respectively. According to Table 1, 15 percent of the sexually active respondents reported that their partner was using the pill at their most recent intercourse, 38 percent had used the condom, eight percent reported use of some other method and 39 percent had used no method of contraception.* There were virtually no differences in baseline contraceptive use between the intervention and control groups.

As shown in Table 2, there was a general improvement in method use by the time of the follow-up survey: Twenty-eight percent of the young men reported that their most recent intercourse at the time of follow-up was protected by the pill, 35 percent by the condom, five percent by other methods and 32 percent by nothing. This improvement reflects in part the fact that youths who had not been sexually active at baseline were more likely to practice more effective contraception than their more precociously sexually active counterparts practiced at baseline. However, the data for those who had had intercourse at baseline showed clearly improved contraceptive practice in the follow-up year.

Differences between the subjects and the controls are also shown in Table 2. When confounding variables were controlled for, the association between the intervention and contraceptive effectiveness was statistically significant among the larger population of all males who were sexually active at follow-up (odds ratio of 1.51, $p<0.05$), and particularly among those who had not been sexually active at baseline (odds ratio of 2.53, $p<0.01$).

The percentage distributions in Table 2 show that any contribution of the intervention is probably reflected in the greater likelihood that the partners of the young men who participated in the reproductive health consultation were protected by the pill. Indeed, logistic regression analysis finds that a partner's use of the pill at last intercourse was significantly associated with the intervention among all subjects who were sexually active at follow-up (odds ratio of 1.66, $p<0.05$). When these subjects are separated into those who had or had not been sexually active at baseline, the intervention's association is strong in the latter group (odds ratio of 3.06, $p<0.01$), but small and not statistically significant in the former group.

Similar findings apply to self-reported main contraceptive method. The proportion saying that the pill was the main method used at most recent intercourse was significantly associated with the intervention among the subjects who had not yet become sexually active at baseline (odds ratio of 2.28, $p<0.05$), but not among those already sexually active at baseline.

One way in which the intervention may have had an impact on contraceptive practice is by increasing the young men's understanding of the safety of various methods of contraception, especially of the pill. (Popular beliefs on this subject have often differed from the medical consensus.[16]) Belief in the safety of oral contraceptives (which was specifically promoted in the reproductive health consultation) was measured at follow-up by a single item in which the respondent was asked to indicate one of four levels of agreement or disagreement with the statement, "Birth control pills are very safe." Among all subjects at follow-up, those who had received the consultation were more likely than those who had not to agree strongly that the pill is very safe (46 percent vs. 37 percent); the odds ratio was 1.43, and the difference was statistically significant at $p<0.01$. However, this belief was not significantly affected among those who were newly sexually active at the time of follow-up; only among those who had already been sexually active at baseline were the recipients of the consultation significantly more likely than the others to believe that the pill is a very safe method (odds ratio of 1.68, $p<0.05$).

One of the most complex and often misunderstood areas of reproductive health is the fertility cycle. An index of fertility knowledge was derived from items that asked respondents to indicate the points in the menstrual cycle when pregnancy is most likely and least likely to occur; in each case, respondents could choose from six alternatives, plus a "don't know" category. Responses were graded from zero to 10 for their approximate relative value in facilitating effective use of the calendar method. Thus, the reply "the first day of the cycle" was scored highest in response to the question on the least fertile time and lowest in response to the question on the most fertile time. The scores for these two items† were averaged as the combined fertility knowledge score and were then collapsed into nine levels with roughly equal numbers of respondents. This measure appears modestly higher in the intervention group than in the control group (odds ratio of 1.37, $p<0.01$), but the effects were strong only among those who had not been sexually active at baseline (odds ratio of 1.5, $p<0.01$), while they were nonsignificant among those who had been sexually active at baseline. (An adjustment was also made in these analyses for an identical baseline measure of fertility knowledge.)

The young men's knowledge about ways to protect against STDs was measured by the simple addition of eight items in a checklist. (All correlations among these items were statistically significant, with more than half between 0.20 and 0.50.) The combined measure was significantly associated with the intervention in the overall study population (odds ratio of 1.98, p<0.001), and also in the two subgroups who had or had not been sexually active at baseline (odds ratio of 1.80 and 2.28, respectively).

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*Some young men may not know about their partner's use of methods such as the pill, diaphragm or sponge. Thus, it is possible that apparent effects of the intervention may be explained by heightened awareness of a partner's contraceptive use rather than a real increase in contraceptive practice.

†The two items were strongly correlated at baseline ($r=0.52$) and at follow-up ($r=0.53$).

An index of AIDS knowledge was constructed as an average of the correct answers to seven statements about AIDS. (Two of the items were poorly correlated with the five remaining items, but were not excluded; correlations among the other items were all statistically significant and ranged in value from 0.16 to 0.36.) The association of the AIDS knowledge index with the intervention was weak (odds ratio of 1.28, p<0.05), but was encouraging nonetheless, considering the modest attention given to this area in the intervention and the external influence of a major areawide media campaign about AIDS that began midway in the project.

We also calculated an index based on two items we believed likely to reflect attitudinal elements that contribute to coercive sexuality. Subjects were asked to indicate one of four levels of agreement or disagreement with the statements "A girl who leads you on should go all the way" and "I might stop seeing some girl if she refused me." (The first statement is commonly heard as an after-the-fact justification for coercive sexual behavior; the second was inspired by a justification often given by young women during medical consultations for why they had participated in unwanted sexual intercourse.) Strong disagreement with both of these statements was scored as zero, strong disagreement with only one of them was scored as one and no strong disagreement was scored as three, yielding a simple index of three levels. The two items were correlated (r=0.32), which suggests that they may share some common attributes. The validity of the index of attitudes toward coercive sexuality was supported internally among the young men who had been sexually active by its significant association with two measures of coercive behavior—having had sex with someone "who was not very happy about having sex" (r=0.17) and having had sex "when you want to and she does not" (r=0.21).

In a logistic regression analysis of intervention effects, we found that coercive sexual attitudes as measured by the index were inversely associated with the intervention in the overall study population (odds ratio of 0.74, p<0.05); the association was weak and not statistically significant among those who had already been sexually active at baseline, but was stronger and statistically significant among those who had not yet become sexually active at baseline (odds ratio of 0.67, p<0.01). The intervention itself had no direct impact on the percentage of males who reported that they had had intercourse when their partner had not wanted to.

Responses to two other items also considered to be plausible representations of coercive sexual attitudes—the subject's agreement or disagreement with the statements "Some girls mean yes when they say no" and "Most girls like to be forced a little"—did not appear to have been influenced by the intervention. A scale constructed from all four items (all of which were correlated) did not yield any significant intervention effects, which weakens our hypothesis that the intervention would have some effect on coercive attitudes generally.

Last, we examined the impact of the intervention on testicular self-examination by asking the number of times the respondents practiced it during the follow-up year. Overall, 30 percent of the intervention recipients but only 11 percent of the controls reported having practiced testicular self-examination three or more times in the preceding year. In contrast, 48 percent of the controls never practiced testicular self-examination in the preceding year, compared with only 24 percent of the intervention recipients. When collapsed into four categories, the number of times a youth had practiced self-examination was dramatically associated with the intervention among all who completed follow-up (an odds ratio of 3.48, p<0.001); this association was stronger among those who had already been sexually active at baseline (an odds ratio of 4.79) than among those who had not yet become sexually active at baseline (an odds ratio of 3.21).

Discussion

The findings of this article support the belief that health care practitioners, health care programs and patient education can play an important role in reaching men. Of special interest is the finding that patient education on sexuality may have a restraining rather than an encouraging effect on young men's sexual activity. Although the only data supporting this conclusion are attitudinal (reduced sexual impatience among those who had never been sexually active), the self-reported behavioral data clearly fail to confirm any promotional effect of such instruction. We interpret these data to suggest that it is groundless to oppose or withhold explicit contraceptive education and services for men because of concern that they may encourage precocious sexual intercourse; in fact, sexual restraint may be promoted in the context of frank treatment of sexuality and contraception.

Of equal interest is our finding that attention to men may affect contraceptive practice. The intervention appears to move sexually active young men forward along a contraceptive career that tends toward increasingly effective contraceptive practice, a trend that we believe is reflected in greater protection by the pill. The logic of this progression may explain why an increase in condom use was not clearly demonstrated in the intervention group, despite an emphasis on condoms in the intervention. The effects of support for condom use may have been obscured by the effects of support for pill use. In a program environment that supports all methods, condom use may become a pass-through category on the way to increasing use of the pill. However, a comparable intervention in today's climate of concern over AIDS may not show the condom to be in such a pass-through category.

We were impressed by the finding that intervention effects on knowledge were visible at the one-year follow-up. An increase in the elusive "knowledge of fertility" may provide additional protection for some of the many youths who may at one time or another try to have "unprotected" sex at the "safe time" of the month. The evidence of improved knowledge was strongest for the prevention of STDs and weakest for knowledge about AIDS, although it is encouraging that even in the latter area some positive impact was noted. The intervention's positive impact on the young men's confidence in the safety of oral contraceptives may provide critical support for effective and continued use of a method that may sometimes be discontinued because of the male partner's opposition.

Coercive sexual behavior may be viewed as a continuum of actions that are enhanced and legitimized by certain beliefs and attitudes. Thus, it is encouraging to have evidence of a reduction in sexual impatience among those who had never been sexually active, if we interpret coercive sexual behavior as a more extreme expression of sexual impatience. Broadly defined, coercive sexual behavior is a major impediment to sexual health for both men and women and not merely another factor of contraceptive failure and disease transmission. The relationship between sex education and noncoercive sexual behavior needs greater exploration; our tentative findings should encourage a redoubling of efforts to reach men in hopes of affecting this dimension of sexuality.

Generally, the strongest effects of the intervention were among the population of young men who were not yet sexually active at baseline or (for effects on attitudes and knowledge) men who were never sexually active. Greater attention should probably be paid to reproductive health during all young men's routine medical visits, rather than only during visits made by young men who are already sexually active or at highest risk. This does not mean, however, that youths who are already sexually active should be given no special attention, or that the intervention had no important effect on this group. Although associations among the already sexually active young men were often not statistically significant, the odds ratios in these cases were always in the same direction as the statistically significant odds ratios seen among the young men who had not been sexually active at baseline. This consistency of direction suggests that some of the weaker, nonsignificant associations may indeed reflect population-wide effects of intervention; otherwise, the direction of at least some of them would likely have been reversed.

The findings on the young men who were already sexually active suggest that additional efforts should be directed to them—especially to those who do not use contraceptives or who are inconsistent users. For these young men, we recommend follow-up consultations and efforts to involve their partners. Additionally, if there is in fact a "contraceptive career" that for many leads from the use of less effective to the use of more effective methods or involves the use of different contraceptives with different partners, it may make sense to promote more vigorously the use of the less effective methods, especially among those who are less effective users of contraceptives. This suggestion should not, however, discourage efforts to promote condom use, since it also has a role in disease prevention.

Our study departs from the more conventional model of interventions targeted at only one or very few outcomes. Some of our objectives may have been better served by a more narrowly focused approach, but it is also possible that efforts aimed at related targets may be mutually reinforcing. If one accepts the idea that behavioral change in one area may be part of a chain of successive steps of accomplishment, the strong results of instruction in testicular self-examination may support other behavioral objectives. Opportunistic combinations may be further justified to achieve cost efficiency: For example, instruction in testicular self-examination may be more cost effective (and may permit more widespread dissemination of the information) when given as part of a contraceptive consultation rather than independently.

The intervention's ability to serve a broad range of objectives, including ambitious informational objectives, rests on its use of audiovisual methods. We believe that if they hold the viewer's attention, highly informative audiovisual materials may be effective alone and may strengthen the related consultation as well. The use of audiovisual support may thus rescue and improve the informational objective, as it also assists the practitioner in concentrating on a less didactic developmental counseling approach when dealing with teenage patients.

The breadth of the intervention may have itself contributed to the most visible contraceptive impact of the intervention—namely, increased use of the pill, which is unlikely to be explained by any single aspect of intervention. We believe that increased protection by the pill is more completely explained by a complex of factors and pathways of causality that come to bear on the couple relationship. For example, reduced sexual impatience, together with less coercive sexuality and, possibly, delayed intercourse, may support couple communication, understanding of health care access and other factors that encourage oral contraceptive use.

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An Assessment of Contraceptive Need In the Inner City

By Stephen E. Radecki and Gerald S. Bernstein

Summary

A survey of low-income areas of Los Angeles County indicates that 41 percent of nonsterile women in their childbearing years who had not made a family planning visit in three years were using some means of birth control, 21 percent were not, 25 percent were not sexually active and 13 percent were pregnant or trying to become pregnant. Given that approximately 10 percent of the respondents were using unreliable means of contraception, at least one-third of respondents were in need of effective contraception. This proportion corresponds roughly to the percentage of respondents who expressed a desire to receive family planning care from a doctor or clinic (34 percent). The percentage of women who were at risk of unwanted pregnancy but not using any method of contraception was greatest among those with incomes below poverty level and among black and Hispanic women. A comparison of survey respondents to a parallel sample of low-income women who had made a family planning visit shows that those who utilized formal family planning services were substantially more likely than those who did not to be married (40 percent vs. 32 percent) and to belong to a health maintenance organization (24 percent vs. 14 percent), whereas nonusers of formal family planning services were slightly older, on average (29.6 years vs. 28.0 years), and more likely to have other types of private health insurance (47 percent vs. 25 percent). In addition, 95 percent of those who were at risk of unintended pregnancy and who had made a family planning visit were practicing contraception, compared with 67 percent of women at risk of unintended pregnancy who had not made a visit.

Within this low-income population of women who had not made a family planning visit in the preceding three years, apprehension about prescription contraceptives was at least as important a barrier to use as was access to services.

Introduction

The historical decline in fertility rates in the United States is seen in virtually every subgroup of the population.[1] There remain substantial fertility differences by race and ethnicity, however, as well as by income. In fiscal year 1987–1988, the U.S. fertility rate was 87.0 births per 1,000 women aged 18–44 among blacks, compared with 66.0 births per 1,000 among whites; among Hispanic women, the fertility rate was 94.0 births per 1,000, compared with 67.5 per 1,000 among non-Hispanics. Fertility was highest (106.4 births per 1,000) among those with an annual income under $10,000 per year and lowest (50.3 births per 1,000) among those with an annual income of $50,000 or more per year.[2]

The introduction of more effective coitus-independent contraceptive methods during the 1960s tended to increase the use of family planning among the poor and diminish existing racial and ethnic fertility differences.[3] Coupled with the subsequent availability of legal abortion, this "contraceptive revolution" led to a decrease in the proportion of births that were unwanted at the time of conception.[4] Race remained a factor, however, with 21.8 percent of births among ever-married black women recorded as unwanted in Cycle III of the National Survey of Family Growth (NSFG), compared with 7.7 percent of births among ever-married whites.[5]

One reason for the continuing fertility differences is the lower rate of contraceptive use among married black women at risk for unintended pregnancy than among married whites.[6] Among women who practice contraception, race is not a significant predictor of contraceptive failure when such factors as age, parity and income are controlled for, but poverty level remains significant: Depending on the method employed, women with an income below poverty level experience first-year contraceptive failure rates anywhere from 50 percent to almost 100 percent greater than those among higher income women.[7] Contraceptive efficacy varies with age as well as income, with poor, young women the least successful users.[8]

Because use of the most effective contraceptives (the pill, the IUD and sterilization) requires a visit to a physician or clinic, and because the patient education provided during these visits may be associated with more successful contraceptive use, utilization of family planning services is a criterion for determining the degree to which the contraceptive needs of a low-income population are met. However, visit rates can provide only limited information about unmet need among subgroups of the population. In contrast to the pronounced differences in the numbers of unwanted births and levels of contraceptive failure already noted, NSFG data showed only a 2.5 percentage-point difference in the rates of visits to family planning providers among women of various

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racial and ethnic backgrounds over the preceding three years, and just a one percentage-point difference in visit rates among women in various poverty-level categories.[9] A telephone survey conducted to analyze barriers to the use of contraceptive services by women with an income below 200 percent of the federal poverty level revealed that negative attitudes and misinformation about the most effective methods of contraception, rather than differential access to contraceptive providers, accounted for the low rates of contraceptive use and high rates of contraceptive failure within this population.[10]

This article examines a potentially underserved group of low-income women, defined here as those who had not made a family planning visit in the three years preceding the survey. The study was designed to meet two primary goals: The first was to determine the family planning needs of these women, including their exposure to the risk of unwanted pregnancy, their use of over-the-counter contraceptives and their knowledge of fertility and of contraceptive efficacy; the second was to identify the personal, cultural and institutional factors that differentiate this group from low-income women who had received formal family planning care. In doing so, we focus on major subgroups of the low-income population, as defined by poverty level and by race and ethnicity.

Methodology

Women who had not made a family planning visit to a doctor or clinic in the preceding three years were surveyed between February and May 1986. These women lived in low-income areas (defined as census tracts in which at least 60 percent of the population identified in the 1980 census was below 200 percent of the federal poverty level) of Los Angeles County—principally downtown Los Angeles, south central Los Angeles and Hollywood. A two-stage random procedure was used to select sample blocks and dwelling units from 63 census tracts (out of a total of 1,644) identified as low-income tracts.

A screening questionnaire was used to determine eligibility for the study by stratifying potential respondents by race and ethnicity (non-Hispanic white, Hispanic or black) and by poverty level (below poverty, between 100 percent and 149 percent of poverty and at 150 percent or more of poverty). To be eligible, women had to be between 18 and 44 years of age (or under 18, if they were legally or informally married) and fertile (including the partner, if they had one), but to have not made a

Table 1. Percentage of low-income women, by fertility risk status, knowledge of fertility and source of family planning care and preference for source of such care; and mean score on knowledge of contraceptive efficacy; all according to socioeconomic characteristics, Los Angeles County, 1986

Characteristic	% at risk of unwanted pregnancy,† not using a method	% who correctly identified a woman's fertile period‡	Knowledge of contraceptive efficacy (mean score§)	% who know of clinic offering low-cost contraceptives	% who would like to get method from MD or clinic
Total	**20.5**	**57.8**	**3.3**	**39.8**	**34.4**
Race/ethnicity					
White, non-Hispanic	16.6	65.3	3.4	40.1	34.8
Black, non-Hispanic	32.9	31.7	2.7	37.2	26.6
Hispanic	31.4*	40.6*	2.9*	41.2	43.1
Education (in yrs.)					
0–5	29.4	34.8	2.8	36.1	46.5
6–9	35.7	34.0	2.9	27.5	28.5
10–11	35.6	30.4	2.6	41.7	22.8
12	27.4	41.7	2.9	29.7	25.4
13–15	19.0	61.4	3.3	48.8	40.2
≥16	8.4*	80.7*	3.7	39.1	39.3
Poverty level					
<100%	27.4	36.8	2.9	35.5	30.1
100–149%	23.5	53.8	3.0	42.2	33.3
≥150%	16.4*	68.8*	3.5*	41.2	36.7
Marital status††					
Currently married	19.6	61.1	3.4	36.9	30.4
Informally married or living together	34.7	59.5	3.4	43.3	68.9
Divorced	26.7	64.8	3.2	47.8	16.9
Separated	16.2	36.3	3.1	44.7	20.5
Never married	17.9*	57.0	3.2	38.3	38.7*
Age					
18–20	30.5	26.0	2.7	19.8	40.2
21–25	27.9	55.1	3.0	49.9	32.2
26–30	16.4	57.7	3.5	34.4	46.7
31–35	20.8	72.0	3.4	58.5	35.1
36–40	12.4	62.9	3.2	31.2	18.2
41–44	20.4*	62.0*	3.6*	48.7*	1.3*
Religion					
Protestant	20.6	56.7	3.3	36.4	33.4
Catholic	25.4	53.3	3.1	44.6	43.5
Other	18.8	61.7	3.0	44.2	17.2
None	14.1*	64.0	3.6	36.0	38.4*
Parity					
0	13.7	63.2	3.4	42.3	47.7
1	30.2	55.9	3.0	28.9	18.8
2	17.5	60.2	3.6	45.1	29.1
3	20.6	52.3	3.0	40.9	15.1
≥4	50.0*	21.0*	2.7*	44.7	21.1*
Regular source of medical care					
Yes	21.6	57.9	3.3	42.0	29.0
No	18.6	57.5	3.2	35.8	43.7*

*Differential across categories is statistically significant at $p<0.05$.

†In this and the following table, women at risk of unwanted pregnancy are those who were sexually active, not pregnant and not trying to become pregnant.

‡In this and the following table, this measure is the percentage who said that a woman is most likely to become pregnant about two weeks after her period begins (selected from a list of six possible answers).

§In this and the following table, the measure is the mean number of methods (out of a total of six) that were placed in correct rank order according to effectiveness, based on first-year failure rates.

††Excluding six widowed respondents.

Note: In this and the following table, weighted percentages are based on 464 respondents who had not made a family planning visit in the preceding three years.

Table 2. Percentage of low-income women, by knowledge of fertility and source of family planning care and preference for source of such care; and mean score on knowledge of contraceptive efficacy; all according to fertility risk status

Risk of unintended pregnancy	% who correctly identified a woman's fertile period	Knowledge of contraceptive efficacy (mean score)	% who know of clinic offering low-cost contraceptives	% who would like to get method from MD or clinic
Not at risk				
Not sexually active	57.3	3.5	29.6	34.0
Pregnant	47.2	2.3	49.5	47.4
Trying to become pregnant	39.6	3.8	13.6	7.4
At risk				
Using a method	68.6	3.4	43.0	42.2
Not using a method	45.7*	2.8*	50.5*	23.0*

*Differential across category is statistically significant at $p<0.05$.

family planning visit within the preceding three years.* Women who classified themselves as Anglo, black or Hispanic† were included until the desired number of respondents for a racial or ethnic subgroup had been reached, after which no further interviews were conducted with women from that category. Those who said they were Hispanic were also asked if they were of Mexican heritage or descent; three-quarters answered that they were.

To determine poverty level, interviewers asked each woman how many related individuals (by blood, marriage or adoption) living in the household she and her husband supported financially. Respondents were then asked the total annual income (before taxes) of the supporting individual or individuals, including salaries (before deductions) and sources such as welfare, Social Security, unemployment insurance, pensions, alimony and child support. (If the respondent could not name a figure for annual income, a set of fill-in tables of weekly or monthly income from wages and others sources was used to assist her in calculating an annual figure.) The income level was then compared with the information on household size to categorize respondents with regard to the federally designated poverty level in effect at the time the survey was conducted.[11]

Approximately one-third of the 464 respondents fell into each of the race-ethnicity and poverty-level strata, facilitating comparisons across these groups. Case-weights from the 1982 NSFG were applied to the data so that they would reflect the national distributions of low-income women in the three racial and ethnic groups.

The response rate for the survey was 82.6 percent. Nonrespondents consisted of 6.9 percent of eligible respondents who refused to be interviewed and 10.5 percent who were estimated to have been eligible but who failed (for various reasons) to complete the screening questionnaire.‡

The surveys were administered (79 percent of them in English, 21 percent in Spanish) by female interviewers and covered the respondents' usual source of medical care, their insurance coverage, and various fertility-related subjects, such as their parity and the size of their family of origin. Respondents were also asked about their sexual activity, childbearing intentions and use of birth control. Specific questions elicited the respondents' reasons for not using birth control (where appropriate), their desire for and awareness of formal family planning care and their general knowledge concerning fertility and the relative efficacy of different methods of contraception. The analysis utilized cross-tabulations, logit modeling (with chi-square tests of significance) for categorical variables and multiple classification analysis for continuous variables. Proportional case-weights have been utilized, so that tests of statistical significance in each table are based on the actual sample size.

We also compared the results of the survey reported here with those of a survey (conducted one year earlier) of women who had visited a doctor or clinic for family planning care within the preceding three years.[12] These comparisons are possible because both surveys used the same sampling frame and the same stratification scheme. Thus, socioeconomically similar groups of women who had or had not utilized formal family planning care can be compared according to a number of demographic, background, health care and economic characteristics. Both samples were weighted to the national population by means of NSFG data, with case-weights broken down by visit status as well as by race or ethnicity and poverty level.

Findings

Twenty-five percent of the respondents said that they were not sexually active at the time of the survey, 6.9 percent were pregnant and 6.1 percent were trying to become pregnant or "wouldn't mind" becoming pregnant. Of the remaining 62.0 percent of respondents at risk of unwanted pregnancy, approximately two-thirds (41.5 percent) were practicing some form of contraception§ and one-third (20.5 percent) were not.

As the following table shows, contraceptive users most frequently said that the diaphragm was their primary method of birth control, followed closely by the condom. (These data were collected in early 1986, prior to the release of the U.S. Surgeon General's report on AIDS,[13] which emphasized the use of condoms to prevent heterosexual transmission of the human immunodeficiency virus.)

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*Each woman was asked: "During the past three years—that is, since [date]—has a doctor, nurse or counselor at an office or clinic talked with you about or prescribed a method for delaying or preventing a pregnancy, or about ways to become pregnant—that is, about family planning?"

†The women were asked: "Do you consider yourself to be Anglo, black, Hispanic, an Asian or Pacific Islander or an American Indian or Alaskan native?" Only women who classified themselves in the first three groups were included in the sample analyzed in this article. Asian women were the target population for a separate family planning survey conducted in the San Francisco area. (See: D. H. Minkler, C. Korenbrot and C. Brindis, "Family Planning Among Southeast Asian Refugees," *Western Journal of Medicine*, 148:349, 1988.)

‡Only 39 of the women identified as being eligible refused to participate. However, in the process of screening thousands of households, we determined that there was a 9.7 percent chance of finding an eligible respondent (whose subgroup quota had not been filled) within a given dwelling. Using this figure, we estimated that 59 additional eligible respondents would have been interviewed from among the residents of the 70 units inaccessible to interviewers because of security devices, the 380 residences where no one was home after repeated visits, the 143 dwellings where the initial contact refused to provide information about the occupants and the 18 units where other problems were encountered. We have considered these 59 cases to be "indirect" refusals; combining these with the 39 actual refusals and the 464 successful interviews yields a total of 562 estimated eligible respondents, and thus a response rate of 82.6 percent. This is consistent with the response to other door-to-door surveys conducted in the Los Angeles area.

§The primary question on contraceptive use was: "Are you currently using any means of birth control—that is, are you or your partner doing or using something to delay or prevent a pregnancy?" Respondents were then asked to indicate the primary contraceptive method being used, or the main reason for nonuse.

Method	**%**
Diaphragm	20.7
Condom	20.0
IUD	13.5
Spermicide	12.6
Sponge	9.7
Oral contraceptives	6.5
Rhythm	3.8
Withdrawal	2.1
Other	11.1
Total	100.0

Even though they had not made a recent family planning visit, some respondents reported using methods that can be legally dispensed only by physicians and clinics. Respondents who said that they were using the pill (more than two-thirds of whom were Hispanic) were equally divided between those who reported having obtained supplies from a retail source (undoubtedly in Mexico, where oral contraceptives are available over the counter) and those who said that they had had pills remaining from their last doctor visit or clinic visit.

Among the nonusers of contraceptives, 27.1 percent said they were not using a method because they were worried about complications, and 15.0 percent gave other health reasons. Another 18.9 percent said that they simply do not believe in contraception, and 11.3 percent reported that they do not worry about it. An additional 6.2 percent reported that they rely on their partner to use birth control, 3.5 percent said that they cannot afford it and 18.0 percent gave another reason.

In Table 1 (page 123), demographic comparisons of women at risk of unintended pregnancy who were not using contraceptives reveal that the percentage was lower among whites and college graduates and higher among poor women, the informally married, those aged 25 or younger, Catholics and those with four or more lifetime births. There was no statistically significant difference by whether the respondent had a regular source of health care. Table 1 also indicates that 58 percent of the respondents could correctly identify the most fertile period of a woman's menstrual cycle. Knowledge of the fertile period was lowest among blacks, women with less than a high school education, those below poverty level, the youngest respondents and those with four or more lifetime births. Some of the same subgroups (blacks, women with incomes below poverty level, the youngest age-groups and those with four or more births) were also significantly less likely to have been able to correctly rank various contraceptive methods in order of their effectiveness.*

When respondents were asked if they knew of a clinic offering low-cost family planning care, about 40 percent indicated that they did, with 18–20-year-olds least likely to know of one (20 percent). Other than this age difference, there were no statistically significant differences in the characteristics of women who knew of such a facility. When asked whether they would like to obtain family planning services from a doctor or clinic, 34 percent of the respondents said that they would. This proportion was highest among the informally married, those 26–30 years of age, Catholics, nulliparous women and those without a regular source of medical care. Finally, comparisons of data on the frequency of intercourse revealed that the respondent's level of sexual activity was unrelated to any of these measures of need or knowledge (not shown).

In Table 2, these measures of knowledge and expressed need for family planning are compared by fertility risk. Knowledge of the fertile period was highest among those using contraceptives, whereas knowledge of contraceptive efficacy was highest among those trying to become pregnant. Awareness of low-cost family planning clinics was highest among pregnant women and nonusers of contraceptives, with approximately half of these respondents able to identify a clinic, and was lowest among those trying to become pregnant.

The desire to obtain family planning care from a doctor or clinic was greatest among those who were pregnant (less than one-third of whom were intentionally pregnant) and among contraceptive users, many of whom employed relatively ineffective methods of contraception. A comparison of users of the condom, IUD and diaphragm with users of other, less effective contraceptive methods indicated no impact of contraceptive efficacy on the level of expressed desire for family planning care (not shown).

The relationship between contraceptive use and the desire to obtain family planning care from a doctor or clinic is not readily interpretable, so a separate analysis limited to women at risk of unwanted pregnancy was conducted; the results are shown in Table 3. (Characteristics other than poverty level, race or ethnicity and marital status have been dichotomized to facilitate their entry into logit models.) Contraceptive use among such women was significantly higher among the following: those with an income at least 150 percent of poverty level, whites, respondents over 30, non-Catholics, high school graduates and those with no previous births. The proportion interested in obtaining family planning care from a physician or clinic was greater among informally married women, those with no previous

Table 3. Percentage of low-income women at risk of unintended pregnancy who are currently practicing contraception, and percentage who would prefer to obtain family planning care from a physician or a clinic, by socioeconomic characteristics

Characteristic	Using a method (N=287)	Would like to get method from MD or clinic (N=287)
Total	**66.8**	**35.8**
Race/ethnicity		
White, non-Hispanic	73.5	34.6
Black, non-Hispanic	43.5	33.3
Hispanic	49.4*	46.0
Education		
<High school	41.0	25.1
High school graduate	72.6*	38.2
Poverty level		
<100%	53.1	27.7
100–149%	65.9	32.1
≥150%	73.3*	40.6
Marital status		
Currently married	73.1	30.4
Informally married or living together	61.2	74.4
Not married	63.4	32.2*
Age		
≤30	59.2	41.8
>30	75.4*	27.2*
Religion		
Catholic	54.0	38.6
Non-Catholic	70.8	34.9*
Parity		
0	75.8	48.8
≥1	59.2*	25.0*
Regular source of medical care		
Yes	64.3	28.4
No	71.0	47.9*

*Differential across category is statistically significant at $p<0.05$.

Note: Weighted percentages are based on sexually active respondents who were not pregnant or trying to become pregnant and who had not made a family planning visit in the preceding three years.

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*The "correct" rank-ordering of effectiveness—sterilization, the pill, the IUD, the condom, the diaphragm and rhythm—was based on first-year failure rates reported in a review of a large number of studies of contraceptive failure (see: J. Trussell and K. Kost, "Contraceptive Failure in the United States: A Critical Review of the Literature," *Studies in Family Planning,* 18:237, 1987). A recent study has suggested that the first-year failure rate for the diaphragm may not differ from that of rhythm once pregnancy data are corrected for the effects of underreporting of abortion (see: E. F. Jones and J. D. Forrest, "Contraceptive Failure in the United States: Revised Estimates from the 1982 National Survey of Family Growth," *Family Planning Perspectives,* 21:103, 1989).

births, those aged 30 or under and those with no regular source of medical care. Frequency of intercourse was found to be unrelated either to contraceptive use or to desire for care within this subgroup of respondents (not shown).

Logit modeling of contraceptive use and desire for family planning services incorporated statistically significant characteristics from Table 3 to determine which factors remain significant when the effects of others are adjusted and to identify any significant interactions of characteristics among women at risk for unintended pregnancy. A logit equation with contraceptive use as the dependent variable (not shown) revealed that the effect of most of the variables (including religion) became nonsignificant after adjustment for other characteristics, but the impact of ethnicity remained significant ($p<0.05$), with contraceptive use significantly higher among non-Hispanic whites than among Hispanics. There was also a significant interaction ($p<0.01$) between age and ethnicity, with contraceptive use tending to increase with age among whites but decrease with age among Hispanics.

The logit model of the desire to receive family planning care from a physician or clinic showed that once the effects of other factors are controlled, being informally married or living with one's partner outside of marriage, and having had no lifetime births were the strongest predictors of this desire, both statistically significant at $p<0.001$. These two factors also interacted significantly ($p<0.001$), with the desire for such care greatest among informally married nulliparous women; there was also a statistically significant interaction between age and having a regular source of medical care, with the desire highest among women 30 or younger who did not have a regular source of care ($p<0.05$).

In Table 4, respondents' demographic information, data on cultural factors and parity, and information on medical care and medical insurance are used to identify the personal, cultural and institutional factors that differentiate the women who had not made a recent family planning visit from those who had received formal family planning care. The comparisons are made with identical measures from a comparable sample of women who had made a family planning visit to a physician or clinic in the previous three years.[14] (Eighty percent of the women who had made a visit in the preceding three years had received care within the past 12 months.) Since poverty level and race or ethnicity served as stratification variables for both surveys, distributions of these variables are identical by design. Most categorical variables in the table are represented by a major reference category (e.g., percentage Catholic for religious preference). For medical insurance, alternative responses were elicited separately to allow for multiple or joint coverages (e.g., Medicaid patients who were members of HMOs); therefore, several insurance categories are shown, along with a total category representing the percentage with one or more types of insurance coverage.

The table indicates that women who had made a recent family planning visit were significantly younger, less educated, more likely to be married and less likely to be employed than were those who had not made a recent visit. Cultural factors included in the table show that recent visitors had also given birth to a greater average number of children, had had a greater average number of siblings and were more likely not to have lived with both parents at age 14. Users and nonusers of family planning providers did not differ in their religious preference or degree of religious participation, or in their concept of the ideal number of children. (The recent family planning clients had not been asked about their frequency of intercourse, so no such comparison can be made for that variable.) Both length of residence in the Los Angeles area and the respondents' knowledge of the fertile period were unrelated to their use or nonuse of formal family planning care (not shown).

Analysis of institutional factors (represented by the respondents' access to a regular source of medical care and by their insurance coverage) shows that those who had made a recent family planning visit were not significantly more likely to have a regular source of care. However, respondents who had made a recent visit were more likely to have been enrolled in an HMO, and were less likely to have private indemnity insurance, such as Blue Cross; Medicaid enrollment did not differ between the two groups. Since many of the significant differences in Table 4 represent potentially correlated factors (e.g., age, education and employment status), eight statistically significant factors (with the various types of insurance coverage represented by the category "one or more types") were examined by controlling for each of the other significant factors. The results of this procedure (not shown) indicated that respondents who had made a recent family planning visit were more likely to be married and were slightly younger than those who had not made such a visit, even when all other potentially explanatory factors (including insurance coverage) were controlled for.

Among the women at risk of unwanted pregnancy (i.e., those who were sexually active, fertile and not pregnant or trying to become pregnant), 95.1 percent who had made a recent visit were using some method of contraception, compared with 66.8 percent of those who had not made a recent visit. In addition, comparing estimates of the cost of family planning visits to a clinic or private physician with the actual out-of-pocket expenses reported a year earlier by women who had made a recent visit* shows that the estimates for both clinic and private physician care given by women who had not made a recent family planning visit were approximately double the actual costs encountered by the women who had made a recent visit—an estimated cost for clinic visits of $33.71 compared with an actual cost of $18.20, and an estimated cost for physician visits of $65.38 compared with an actual cost of $32.80. Both the estimated and actual costs excluded the price of prescribed contraceptives—which, for women who had not made a recent family planning visit, ranged from $6 to $12 per month for over-the-counter birth control methods that they could have obtained at little or no cost from subsidized clinics. This cost difference would in part be offset by travel time and other convenience factors.[15]

Finally, respondents who had made a recent family planning visit were more likely to have had one of several types of physical examination or test in the year preceding the study. The proportion who had had a general medical examination was somewhat higher among those who had made a recent family planning visit (52.0 percent) than among those who had not (43.0 percent). The proportion who had had a Pap smear, a breast exam or a urinalysis, was substantially higher among those who had made a recent family planning visit (85–87 percent) than among those who had not (52–57 percent). The reported rate of tests for sexually transmitted disease was 71.0 percent in the former group and only 23.9 percent in the latter.

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*The cost for women who had not made a recent family planning visit is based on their estimate of what the cost would be; the cost for women who had made such a visit is based on the actual cost of their visit. The actual cost of family planning clinic care was based on data from 79 respondents who had visited a clinic and reported their out-of-pocket costs, and is not weighted; similarly, the actual cost of a private physician visit is based on data from 57 respondents, and is not weighted. For both estimated and actual averages, responses of "no cost" (which would tend to artificially reduce actual costs vis-à-vis respondent estimates) were excluded, so all figures apply to those who incurred or anticipated at least some out-of-pocket expense.

The percentage making a family planning visit in the preceding three years who had had a Pap smear or breast examination was slightly below the proportions reported in the NSFG among women who had made a family planning visit in the previous 12 months.[16] However, the rate of tests for sexually transmitted diseases among recent visitors (71.0 percent) was substantially higher than the comparable NSFG figure (50.0 percent overall, and 54.8 percent among those with incomes under 150 percent of poverty).[17]

Discussion

We have examined the fertility status, accuracy of reproductive and contraceptive knowledge and desire for family planning services among low-income women who had not received family planning care from a physician or clinic within the preceding three years. The survey data that we used were derived from stratified random samples drawn from low-income areas of Los Angeles County, and were adjusted to national distributions of poverty-level and near poverty-level women using population estimates from the NSFG. Although the resulting weighted data could therefore be generalized to low-income populations in other areas, it should be noted that three-quarters of the women in the study's Hispanic subsample were of Mexican descent (thereby differing from areas outside of the southwestern United States), and that there may be regional differences within other study strata as well.

The percentage of women at risk of unwanted pregnancy but not practicing contraception (21 percent) and the percentage of women who are already unintentionally pregnant (five percent) indicates that a minimum of one-fourth of those who had not made a family planning visit in the preceding three years could derive some benefit from having access to such services. Inclusion of women who used less effective methods of contraception (e.g., withdrawal or over-the-counter methods other than the condom) increases this proportion to just over one-third. This estimate is roughly equivalent to the level of expressed desire for services: The survey results indicated that 34 percent of respondents would like to obtain family planning care from a doctor or clinic. A comparison by socioeconomic characteristics of the more "objective" measure of the need for family planning services with women's "subjective" desire for services showed that women who are informally married or living with their partner are unlikely to be using contraceptives but have a high desire for care. In general, however, those at higher risk of unwanted pregnancy (in particular, women below poverty level, along with blacks and Hispanics) are not more likely to express a desire for family planning services.

The risk of unwanted pregnancy was found to be related to low levels of knowledge about fertility or contraceptive practice, particularly in the age-group most likely to be at risk (18–20-year-olds) and among women with five or more lifetime births. The relationship of knowledge to contraceptive use was investigated in a study that identified negative attitudes toward prescription contraceptive methods as a barrier to the use of contraceptive services by low-income women.[18] This effect is reflected here in the 42 percent of nonusers who cited "worries about complications" or other health reasons as explanations for their nonuse of contraceptives, as well as in data from a national poll revealing that people had exaggerated perceptions of the health risks associated with the use of oral contraceptives.[19] Within this low-income population, therefore, apprehension about prescription contraceptives was at least as important a barrier to utilization as was access per se.

With the exception of clinics that offer outreach for clients who may not perceive themselves to be at risk,[20] most organized family planning programs have a primary goal of providing contraceptives to people who request them, and such programs may not be able to do much to remedy the educational deficits of nonusers. It should be possible, however, to increase public awareness about the availability of clinic services among low-income populations; marketing efforts by family planning clinics could be an increasingly important means of improving both awareness and utilization of clinic services.

The comparison of data for women who had made a recent visit with those who had not revealed a number of differences between the two groups, but could not involve poverty levels, since this was a stratification variable. National data, however, show that there is virtually no difference in the utilization of family planning care over the preceding three years between women with incomes below 150 percent of poverty and those with incomes above this level.[21] Those who had not made a recent family planning visit were shown in Table 4 to be somewhat older than those who had made such a visit and were also less likely to be married.

Table 4. Percentages and means of various characteristics among low-income women who had or had not made a recent family planning visit, by type of variable

Variable	No recent visit (N=464)	Recent visit (N=454)
Personal		
% married	31.7	40.3*
Mean no. of times married	1.2	1.2
Mean age (in yrs.)	29.6	28.0*
Mean education (in yrs.)	13.5	12.7*
% employed	60.0	47.3*
Cultural		
% Catholic	26.7	24.0
Mean no. of religious services attended per year	17.7	18.4
% who believe religion to be very important	43.3	37.8
% not living with both parents at age 14	27.3	38.0*
Mean no. of siblings	4.3	4.8*
Mean ideal no. of children	2.6	2.6
Mean no. of children ever born	1.0	1.3*
Mean no. of abortions	0.3	0.4
Institutional		
% with a regular source of medical care	63.8	66.4
% with HMO coverage	14.1	23.5*
% with private indemnity insurance	47.3	25.0*
% with other types of insurance	1.4	3.6*
% with Medicaid or other public insurance	14.0	19.8*
% with one or more types of insurance	76.4	70.3*

*Differential across category is statistically significant at $p<0.05$.

Note: Percentages and means are based on weighted data.

Although the presence or absence of insurance coverage did not differ between the two groups when other characteristics were controlled for, a comparison of separate types of coverage revealed that respondents covered by Medicaid or enrolled in an HMO (which generally covers family planning care) were more likely to have made a family planning visit; respondents with private indemnity insurance (which generally does not provide family planning coverage) were more likely to have forgone formal family planning care, despite the availability of low-cost family planning clinics. Those who had not made a recent family planning visit to a doctor or clinic overestimated the cost of such a visit by a factor of two, and women who utilized over-the-counter methods of contraception could potentially have obtained

(Continued on page 144)

Research Note

Factors Associated with Postpartum Care Among Massachusetts Users of the Maternal and Infant Care Program

By Michael D. Kogan, Mary Leary and Thomas P. Schaetzel

Introduction

A postpartum visit is generally considered an essential component of perinatal care for both mothers and infants. Postpartum care ensures that a woman is not experiencing complications following delivery, and provides an important opportunity to assess the infant's progress, the family's ability to cope and whether pediatric care and other services are being received.

Postpartum care may also have an effect on family planning and contraceptive use. One study notes that 50 percent of women will have intercourse, often unprotected, by the end of the second month following delivery.[1] Postpartum contraceptive counseling has been effective in preventing repeat pregnancies within a short period after delivery,[2] and research has shown that there is a positive correlation between a postpartum visit and increased contraceptive use a year after delivery.[3] Epidemiological studies have shown increased risks of intrauterine growth retardation,[4] low birth weight[5] and infant mortality[6] to be associated with a short interval between births. Although these are significant reasons for promoting postpartum care, factors associated with whether a woman returns for a postpartum visit have not yet been examined and are the subject of the study reported in this article.

Data for this study, for the period 1985–1987, were drawn from records of the 21 Maternal and Infant Care (MIC) offices operated by the Massachusetts Department of Public Health and located at community-based facilities in high-risk areas. MIC services include a postpartum visit within 2–6 weeks after delivery. Data are collected from each MIC registrant on demographic characteristics, amount of perinatal care utilization, type of delivery, birth outcomes, health habits and, beginning in 1986, source of payment. The Department of Public Health uses this information to evaluate health services and other programs.

During the period of investigation, 13,921 women registered for care at MIC sites and remained in the program through delivery. To determine what variables were associated with returning for postpartum care, maternal age, education, parity, ethnicity, primary language, marital status, site of prenatal care, adequacy of prenatal care (a measure derived from trimester of registration and number of prenatal care visits, adjusted for gestational age*), mother's length of hospitalization, transfer of the infant to a neonatal intensive care unit, length of pregnancy, birth outcome, type of delivery and birth weight were examined. Payment source, a variable for 1986–1987 only, had four categories: no insurance, Medicaid, Blue Cross/Blue Shield or other commercial insurance, and Healthy Start, a state-funded reimbursement program created in December 1985 to pay for obstetric care of women with incomes between 100 and 185 percent of the poverty level.

Results

The sociodemographic characteristics of the women in the study indicate that MIC programs serve women for whom ongoing care, especially postpartum, could make a significant difference, both to their own well-being and to that of their infants. As the table shows, 24 percent of the deliveries in the MIC program were to teenagers—a group especially vulnerable to early repeat pregnancies—compared with about eight percent statewide.

Characteristic	MIC (%)	Statewide (%)
Education <12th grade	48.1	13.2
Unmarried	61.8	19.4
Age <19	24.0	8.4
Racial/linguistic minority	58.6	12.7

Unmarried women, women with less than a complete high school education and members of minority groups were also greatly overrepresented among MIC patients.

During the three years of the study, 78 percent (10,854) of the women who received care at an MIC office returned for a postpartum visit. The percentage of women returning for postpartum care for each significant variable is presented in Table 1. The largest effect appeared to be associated with adequacy of prenatal care utilization: Only 63 percent of women with inadequate utilization returned for a follow-up visit, compared with 76 percent of women with intermediate care and 86 percent of women with adequate care. The higher the woman's level of education, the greater the likelihood that she had a postpartum visit: Women with a ninth grade education or less returned 77 percent of the time, compared with 78 percent for women with up to a 10th or 11th grade education, 81 percent among those who had completed high school but had no more schooling and 85 percent among women with some college education. The more children a woman had, the less likely she was to return: While 82 percent of the women with first births returned, 77 per-

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Michael D. Kogan, an epidemiologist with the National Maternal and Health Survey of the National Center for Health Statistics, was an epidemiologist with the Massachusetts Department of Public Health at the time this study was conducted. Mary C. Leary is director of the Bureau of Community Health Programs and Thomas P. Schaetzel is a research analyst with the Division of Family Health Services, both of the Massachusetts Department of Public Health.

*The measurement for adequacy of prenatal care utilization that is used in this paper is the Kessner index. The index relates the frequency and timing of prenatal visits to gestational age. A woman's prenatal care is classified as "adequate" if it begins in the first trimester and includes nine or more visits for a pregnancy of 36 or more weeks; and "inadequate" if it begins in the third trimester or includes four or fewer visits for a pregnancy of 34 or more weeks.

cent of those with second or third births and 70 percent of those with fourth or subsequent births did so.

Women who did not speak English were more likely to return than women who did (78 percent, compared with 82 percent). Subsequent analysis revealed that this was largely because non-English-speaking Asian women had the highest return rate for postpartum care (92 percent, compared with 79 percent for both white and black women, and 73 percent for Hispanic women). Women under 26 years old were less likely to return than those in the older age-group. Those who had had live births were more likely to return than women who had had either a stillbirth or infant death. Seventy-eight percent of women who had delivered vaginally without forceps returned for postpartum care, compared with 72 percent who had delivered vaginally with forceps, 81 percent who had had a primary caesarean section and 73 percent who had had a repeat caesarean.

Factors associated with postpartum care were examined by year of delivery to look for time trends. In 1985 and in 1986, 78.8 percent of the women returned for postpartum care; in 1987, there was a decrease to 76.4 percent. The percentage of women with adequate prenatal utilization who returned for postpartum care declined each year, from 87.4 percent in 1985 to 85.9 percent in 1986 and 83.8 percent in 1987. A trend analysis indicated that this decrease was statistically significant ($x^2 = 9.0$, $p < 0.01$).[7] The percentage of black women who received postpartum care also declined, from 81.5 percent in 1985 to 68.2 percent in 1987. Trend analysis revealed that this decrease was significant as well ($x^2 = 44.8$, $p < 0.01$). The decline in the proportion of women receiving adequate postpartum care may be due in large part to a decline in postpartum visits by the black population. There was no change in the proportion receiving adequate postpartum care among nonblack groups.

A multivariate analysis of the factors using logistic regression showed that for all three years of the study, the strongest association with whether a woman returned for postpartum care was her use of prenatal care. The odds that a woman who had had inadequate prenatal care would not return for postpartum care were almost three times greater than the odds for a woman who had had adequate prenatal care (odds ratio = 2.8). Women who had had intermediate utilization of prenatal care were also less likely than those with adequate care to have postpartum follow-up (odds ratio = 1.6). Other factors associated with lack of postpartum care in the multivariate analysis included Hispanic ethnicity compared with white race (odds ratio = 1.2), second or later birth compared with first birth (odds ratio = 1.7) and having a repeat caesarean section (odds ratio = 1.5). Asian women were less likely than white women to decline postpartum care (odds ratio = 0.5). When multivariate analyses were conducted for each year, the findings were shown to be stable across years: The most important factor in all three years was adequacy of prenatal care. In 1987, however, blacks were more likely than whites not to return for postpartum care (odds ratio = 1.4).

Whether payment source influenced postpartum care was explored in multivariate analysis by combining the years 1986 and 1987 only. Women on the Healthy Start program were less likely to miss postpartum care than women who had commercial insurance. Healthy Start also affected the relationship between ethnicity and postpartum care: When Healthy Start was included in the model, there were no significant differences between the rates at which Hispanics and whites returned for postpartum care. There were also no significant differences between blacks and whites in 1987 when payment source was controlled for.

Discussion

Certain factors that could not be examined by the available data may have influenced the results of the study—whether women went for postpartum care at sites other than an MIC clinic, for example. In addition, there were differences among the sites of care in the proportion of women returning for postpartum visits, ranging from 45 to 100 percent. Consequently, sites were entered into the logistic regression model as dummy variables. After other factors were controlled for, six sites were independently associated with a low return rate, for which there could be several reasons. All but one were outside of Boston and its public transportation network; five were in areas where waiting times may have been longer owing to provider shortages; and all six were in areas with large immigrant populations, where communication may have been difficult.

The data indicate that the decline in postpartum care among women who received adequate prenatal care was due to less use by the black population, without which there would have been no change in the percent receiving postpartum care. During the study period, significant numbers of obstetricians withdrew from the Medicaid program because of conflict over reimbursement. This was particularly problematic for low-income areas where there was already a shortage of obstetric providers. Women experienced longer waiting times at facilities accepting Medicaid, and often had to find other sources of care because their usual provider would not accept Medicaid. Because more black women were receiving Medicaid and attending MIC clinics during this time, the shortage of care may have affected them more than other women.

Table 1. Percentage of women who returned for postpartum care, by selected characteristics, Massachusetts, 1985–1987

Characteristics	%
Prenatal care (N=13,426)	
Adequate	85.5
Intermediate	75.7
Inadequate	63.4
Education (N=13,655)	
≤9th grade	77.4
10–11th grade	78.2
12th grade	81.1
Some college	84.6
Parity (N=13,811)	
1st birth	81.3
2nd or 3rd birth	77.5
≥4th birth	70.2
Ethnicity/race (N=13,798)	
White	79.2
Black	79.0
Hispanic	73.4
Asian	92.3
Primary language (N=13,445)	
English	76.7
Non-English speaking	83.1
Marital status (N=13,688)	
Married	82.6
Single	74.9
Divorced	77.0
Separated	77.7
Age at delivery (N=13,901)	
≤26	77.3
>26	82.2
Birth outcome (N=13,898)	
Live birth	86.7
Stillbirth	76.2
Infant death	72.3
Type of delivery (N=13,331)	
Vaginally without forceps	78.4
Vaginally with forceps	71.6
Primary caesarean section	81.4
Repeat caesarean section	73.5
Payment source* (N=8,270)	
Medicaid	73.5
Commercial insurance	85.4
Healthy Start	87.4
Self-pay	76.7

*1986–1987 only.

Previous studies have documented an association between prenatal utilization and improved birth outcomes.[8] Because of the strong association between postpartum follow-up and adequacy of prenatal care, the current findings build on earlier research and have several implications for program planning. Strategies need to be developed for reaching women as early as possible in their pregnancies and ensuring continuous care. Such standards would set the stage for postpartum family planning counseling, particularly in high-risk populations. Media and outreach campaigns with a broad base of involvement, such as business, religious and community-based groups, can help women get access to care.

The data also suggest that elimination of financial barriers can increase the chances of women returning for a postpartum visit: Women whose postpartum care was covered by Healthy Start were significantly more likely to stay in care than were women without health insurance who did not qualify for this program or for Medicaid. Women involved in Healthy Start may also be more likely to seek postpartum care because of the patient education and follow-up that is part of that program, indicating that a combination of financial access, education and follow-up is needed to ensure comprehensive prenatal and postpartum care.

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SPECIAL REPORT

Contraceptive Development: Why the Snail's Pace?

By Lisa Kaeser

Few products touch so many people in such intimate and yet far-reaching ways as contraceptives do. Nonetheless, according to a National Academy of Sciences report, currently available methods are not well suited to the religious, socioeconomic or health circumstances of many Americans, making a wider array of safe and effective methods highly desirable.

The report, *Developing New Contraceptives: Obstacles and Opportunities*,[1] was released in January 1990. It summarized two years of findings by the Committee on Contraceptive Development, which included physicians; public health, public policy and legal experts; pharmaceutical company executives; reproductive biologists; economists; and demographers.* The committee analyzed the barriers currently facing the development of new methods in this country and suggested ways to accelerate the pace of research by altering the organizational structure and policies governing work in this field.

Current Practice and Prospects

Although it is well accepted that a broad array of contraceptive drugs and devices is required to meet the varying needs of men and women at different stages of their lives, many subpopulations are not well served by methods now available to them, the committee notes. Particularly ill-served groups include teenagers who use contraceptives only sporadically, young mothers who are breastfeeding their infants, and comparatively older couples with completed families who do not yet wish to undergo sterilization.

The benefits of careful contraceptive use are well established: Users reduce their risk not only of unintended pregnancy and abortion but also of health problems related to frequent pregnancy and childbirth; adequate spacing of children may have beneficial effects on the entire family's health. Despite these advantages, concern persists over the relative safety, effectiveness, cost, convenience and acceptability of various methods; newer technologies pose questions of risk that may be difficult to evaluate until methods have been used over the full course of a woman's reproductive life. Yet the health risks of pregnancy, labor and delivery and the social costs of unwanted pregnancy and childbirth may be underrated.

Oral contraceptives occupy a noteworthy position in U.S. pharmaceutical history; rarely has a drug been taken by so many people for preventive purposes. The pill is currently the most common form of contraception used in this country, followed by female sterilization, condoms and vasectomy. (If female and male sterilization are combined, sterilization is the leading contraceptive method in the United States.) Among women aged 15–44 who have ever had intercourse, 95 percent have used one or more contraceptive methods. Although the proportion of sexually active people who have ever used a contraceptive method is high, so too are contraceptive failure and discontinuance rates. The committee cited estimates that contraceptive failure alone probably led to 1.6–2.0 million accidental pregnancies in the United States in 1987 and that such pregnancies constitute about half of the 1.5 million abortions performed each year. According to the panel, various studies have concluded that if more options were available, better matches between method and user would be possible. In addition, new methods can both attract new users and help society meet changing needs, such as combatting the increasing incidence of STDs.

Nonetheless, the committee stated, no fundamentally new contraceptive methods have been approved for use in the United States since the advent of the pill and the IUD in the 1960s. Since then, most new methods have been only modest improvements or variations upon existing methods. Predicting when even these variations might become available has been difficult because of the uncertainties of scientific research, funding, marketing feasibility and procedures for regulatory approval. For example, the committee pointed out that a 1980 survey of contraceptive development experts named nine birth control methods they considered likely to be available by 1990, but that only three of these (triphasic pills, the TCu 380A intrauterine device and the sponge) are currently available in the United States. Given this unpredictability, the committee was reluctant to list specifically what, when and where new methods could be expected. However, their report also emphasized that with the right environment, significant new developments would be possible; in some cases, new drugs or devices are already being tested or used in other countries.

Not surprisingly, the majority of contraceptive methods making their way

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*The committee was chaired by Luigi Mastroianni, Jr., Department of Obstetrics and Gynecology, University of Pennsylvania. Members were William A. Campbell, Institute of Government, University of North Carolina; Richard M. Cooper, Williams and Connolly, Washington, D.C.; Patricia Munch Danzon, The Wharton School, University of Pennsylvania; Carl Djerassi, Department of Chemistry, Stanford University; Anibal Faundes, Department of Obstetrics and Gynecology, State University of Campinas, Brazil; John E. Jefferis, Pfizer, Inc., New York; Charles B. Keely, Department of Demography, Georgetown University; Patricia A. King, Georgetown University Law Center; Lois A. Montiero, Department of Community Medicine, Brown University; Jane M. Mutambirwa, School of Medicine, University of Zimbabwe; Judy Norsigian, Boston Women's Health Book Collective; Gordon W. Perkin, Program for Appropriate Technology in Health, Seattle; Allan G. Rosenfield, School of Public Health, Columbia University; Peter Temin, Department of Economics, Massachusetts Institute of Technology; and Burton A. Weisbrod, Department of Economics, University of Wisconsin.

through the research and regulatory pipelines are for women rather than for men. Many of these are not new methods per se, but simply new delivery systems for contraceptive steroids—including injectables, implants, transdermal patches, vaginal suppositories and rings, and sublingual (administered under the tongue) tablets. These systems offer a slower and more constant release of a drug into the bloodstream than does the pill, which may result in fewer adverse side effects; they may also be more convenient. Further into the future may be a contraceptive vaccine, immunizing a woman either against hormones needed in pregnancy or against sperm. A vaccine for men will probably not be feasible within this century, according to the committee.

Several other modifications of existing methods are well along in clinical trials, and may become available in the United States within this decade. Among these are oral contraceptive compounds, already introduced in Europe, that would allow for significantly reduced doses compared with those currently on the U.S. market. Another is the elusive ovulation predictor, which could measure changes either in body temperature or in cervical mucus or could be a more advanced biochemical version of the ovulation predictor that would detect hormones produced by the ovaries. New hormone-releasing and copper IUDs also have been tested, as have disposable diaphragms. Research on female condoms and new spermicides is focusing on possible prophylactic benefits against sexually transmitted diseases, and much attention is being given to the development of reversible sterilization techniques for both men and women.

Widely used elsewhere but unavailable in the United States are the injectables Noristerat, which lasts two months and has been approved in 40 countries, and Depo-Provera, which lasts three months and is available in about 90 countries. In addition, NORPLANT®, a five-year subdermal implant, is in use in 12 countries and is being tested in many more. The Multiload IUD is used in Europe, and the Filshie clip and Ovabloc silicone plugs (both methods of female sterilization thought to increase the possibility of reversal are already available elsewhere).

Thus, the committee found, people in the United States have comparatively limited contraceptive options. Although it seems likely that some improvements may be made within this decade, the prospects of having one or more fundamentally new methods by the year 2000 are few.

Obstacles to New Methods

After evaluating the current situation, the committee focused on obstacles to contraceptive development in the United States, making recommendations it felt were necessary to implement if new methods are to reach the marketplace. The four most problematic obstacles cited were the attitudes of the American public, the organization of and resources available for research, federal regulations and product liability.

Public values regarding contraceptive practice are crucial to the support of future research and development, the committee argued, and although American society seems permissive and sexually liberated, American attitudes toward reproduction and contraceptive use have historically been "remarkably conservative." Perhaps growing out of the country's religious roots and a religion-oriented view of work, sex and the family, the initial response of state and federal governments was to restrict contraceptive products and information, often equating them with obscenity.

Moreover, contraceptive-related views may be affected by attitudes toward particular issues, such as sterilization and abortion. For example, sterilization was initially associated with the eugenics movement, and in 17 states, laws authorizing the involuntary sterilization of particular groups of people remain on the books. Furthermore, contraception and abortion are often linked politically, both by groups that oppose abortion and by those that support contraceptive practice along with a woman's right to choose abortion. In addition, the distinction between contraception and abortion has been clouded by the uncertainty over early reports on the French drug RU 486, which emphasized the drug's possible use as a once-a-month pill, although to date it has shown success only as an early abortifacient.

Even the law of supply and demand has not translated well to the business of developing new contraceptives. Although most people who use them would agree that currently available methods are far from perfect, no loud demand for new methods can be heard. Some of the groups that would be expected to support the wide-scale provision of the broadest array of methods, such as feminist and consumer groups, are also among those most critical of the newer methods as being potentially dangerous or unhealthy.

The committee concluded that the net impact of the nation's values had probably been to slow contraceptive development and to reduce support for research: "Whatever the reasons, the nation offers far more support for research to alleviate specific illnesses than to prevent the burdens and trauma of unwanted pregnancy and its medical, psychological, and social consequences" [p. 149]. Nonetheless, the report held out hope that the future might be better. In recent decades, there has been a growing acceptance of fertility regulation by the general public and increasingly smaller differences in actual contraceptive practice among various ethnic and religious groups. This, along with changing attitudes toward sex, women, work and the family, may contribute to a more favorable climate for contraceptive development.

The committee reviewed the research activities of the federal government, universities, private industry and nonprofit organizations to determine the institutional barriers to contraceptive development. Predictably, it found that anything that increases financial rewards will increase the involvement of the private sector, while anything limiting federal government support will lessen that of nonprofits. Since the 1960s, private-sector involvement in contraceptive development has diminished in the United States, with only one large pharmaceutical company (Ortho Pharmaceutical Corp.) still involved in contraceptive research; in contrast, a half dozen companies spent several million dollars annually on contraceptive research and development in 1970. Activity by small single-purpose firms, universities and nonprofit organizations has increased, and these entities have their advantages: Smaller companies are often willing to take financial and political risks that large companies shy away from, university researchers have the flexibility to instigate and follow through on a wider variety of new ideas and nonprofits are less pressured by time constraints. Nonetheless, only large firms can undertake all the aspects of development and marketing, so the work by other organizations usually has to be done on a collaborative basis that is often less efficient than that done by a large company.

Funding levels are difficult to measure, but the committee concluded that federal funding for research in reproductive biology has increased only modestly since the mid-1970s, and federal contributions to applied contraceptive development have declined. Furthermore, private foundation support for basic research in the reproductive sciences has declined dramatically. Declining or sporadic funding from foundations and government agencies has also contributed to a reduction in the number of scientists being trained in the field. In turn, the lessened interest of pharmaceutical companies has resulted in fewer research opportunities, and those scientists who might have contemplated a career in contraceptive research have been deterred.

In analyzing the impact on contraceptive development of regulatory procedures implemented by the Food and Drug Administration (FDA), the committee found that the time involved and the enormous costs and amounts of data required for approval have reduced incentives to research by shortening a product's patent life on the open market and, thus, its profitability. Although patents grant the developer of a drug 17 years of exclusive rights, the patent generally must be secured long before FDA approval to market the drug is obtained. The average time it takes a product to wind its way through the FDA approval process has increased in the past two decades, shortening the time from FDA approval to patent expiration from 14.4 years in 1967 to 7.9 years in 1984.

In determining the acceptability of new products and devices for the U.S. market, the FDA attempts to balance risks against benefits. People are generally willing to take risks if dramatic benefits, such as the cure of a severe disease can result. The committee notes, however, that FDA requirements for approval of proposed contraceptives have been much more demanding than for other drugs because the agency views contraceptives as intended for use by healthy women, most of whom have alternative birth control options. Yet, the committee contended, weighing the risks and benefits of contraceptives is different from weighing the risks and benefits of other drugs, and the FDA procedures do not allow for that difference. The benefits of contraceptives are less tangible than lowering blood pressure levels or shrinking tumors, benefits that can easily be measured in each patient. But how does one assess the value of avoiding an unwanted pregnancy, especially since it is more important to some women not to become pregnant than it is to others, and some women may be willing to take bigger risks to prevent an unintended pregnancy? Vast numbers of women are not in excellent health, and methods with fewer side effects are not necessarily safer for them if they have higher failure rates and expose them to the risks of pregnancy and delivery. Furthermore, the committee noted that the FDA is geared to weighing only physical benefits and does not consider other benefits of contraceptive use, such as psychological and economic ones.

The committee noted that the 50 different products liability laws in each of the 50 states, whose objective is to ensure compensation for people injured by unsafe products and to resolve disputes between the injured parties and the product's manufacturer, pose costly uncertainties for contraceptive manufacturers. In addition, the number and size of jury awards are perceived to have increased over the last few years, with future trends even more unpredictable. As a result, liability insurance—covering both the conduct of clinical trials and the use of a finished product—is prohibitively expensive and, in some cases, nearly impossible to obtain. Contraceptive development was badly damaged by the insurance crisis of the mid-1980s, the committee concluded, and the field has not yet emerged from that crisis. The large awards and lack of obtainable insurance led to FDA-approved products being withdrawn from the market, and to manufacturers themselves leaving the contraceptive field altogether.

Recommendations

The committee made recommendations in each of the substantive areas it addressed, saying first of all that an expanded understanding of the "user perspective" is required. Too often, methods fail, and expose the user to the medical risks associated with pregnancy and childbirth, because they are too expensive, too difficult to use or have unacceptable side effects.

Consequently, the committee recommended that the FDA assign more importance to the effectiveness and convenience of new contraceptives. The purpose of this change would be to make new contraceptives available to particular groups in the population not adequately served by currently available methods. The new methods might have a higher risk-profile than methods approved under the assumption that everyone taking contraceptives is completely healthy but it would be a risk profile more suited to the social, medical and value systems of particular groups of users. The committee also recommended the establishment of a comprehensive postmarketing surveillance system so that FDA approval would be followed by long-term studies providing systematic and timely feedback about positive and negative effects. The committee found the current system inadequate and concluded that, through either higher prices or injuries, consumers have carried most of the burden for the lack of adequate follow-up.

Since it is unlikely that manufacturers will re-enter the contraceptive development field without some changes in product liability, the committee recommended that Congress enact a federal products liability statute, which would give uniformity to what is currently an unpredictable and confusing situation created by 50 different state laws. The federal statute should also be designed to give manufacturers some protection from negligence claims because their products have been approved by a stringent FDA review process. (Such protection would not be available, however, if the manufacturer had withheld relevant information or had failed to report adverse effects.)

Because the committee believes that research in reproductive biology and contraceptive development is underfunded, it recommended that the National Institutes of Health consider increasing its funding of contraceptive development and that federal funding keep pace with the rising costs of research and development. Private foundations should also increase their commitment, the committee argues, and all funders should provide long-term commitments, because new product development is a long-term process. Because of the uncertainty of and fluctuations in funding, the pool of basic and clinical investigators engaged in development is small and one of the principal impediments to progress. Therefore, the committee recommended that efforts be made to attract young scientists, perhaps through special training and grants programs.

The committee recognized that no single factor, or simple solution, could determine or improve the mix of contraceptives available or the speed with which new products are brought to market. Nonetheless, the report noted that the increasing number of young men and women who opt for surgical sterilization, the prevalence of abortions and the very high rate of teenage pregnancy were among factors pointing to the need for a more strenuous effort.

The report stated, "The regulation of human fertility is a complex process, and the development of new contraceptive products costs millions of dollars and takes years . . . to complete. There are, however, opportunities for innovation that are not being pursued. . ." [p. 10]. Furthermore, it warned, "Unless steps are taken now to change public policy related to contraceptive development, contraceptive choice in the next century will not be appreciably different from what it is today" [p. 153].

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DIGEST

French Trials of RU 486 Find 96 Percent Abortion Rate in Pregnancies of Less Than Seven Weeks

Abortion can be induced without surgery at least 96 percent of the time when the antiprogestin mifepristone (better known as RU 486) is given, along with a prostaglandin, to women pregnant for less than seven weeks, according to the results of a large-scale French trial.[1] The pregnancies of women who took the largest dose of prostaglandin were terminated almost 99 percent of the time, substantially more quickly than those of women who took smaller doses of the prostaglandin. However, women who used the larger dose also experienced substantially more pain during the abortion and bled longer afterwards than did those who used the smaller dose.

In September 1988, the French government approved the marketing of mifepristone as an abortifacient. The drug can be used only during the first seven weeks of amenorrhea, and only along with a prostaglandin. The two-stage medical treatment,* which involves taking RU 486 first and the prostaglandin several days later, became available to French women (under tight controls and at a limited number of sites) early in 1989. Since then, more than 40,000 women have taken mifepristone in order to obtain an abortion without having surgery. Eighty percent of the cost of the abortion is borne by the national health insurance plan; at present, the total cost of a nonsurgical abortion in France is the equivalent of about $250.[2]

In order to analyze the effectiveness of the mifepristone-prostaglandin combination, the investigators collected data on women who had abortions between April and November 1988 at 73 legally authorized abortion centers—about one-tenth of all such centers in France. To be eligible to use mifepristone, the women must have been amenorrheic for no longer than seven weeks and have no sign of an ectopic pregnancy or any conditions considered to be contraindications either to the use of mifepristone (adrenal insufficiency, long-term usage of glucocorticoids or a history of blood clotting problems) or prostaglandins (asthma or severe hypertension).

Seventy-five of the 2,115 women who were treated did not return for a follow-up visit, so the investigators included only the 2,040 women who did. Of these, 76 had not been given a prostaglandin because they aborted or needed a vacuum aspiration or curettage shortly after taking the mifepristone. All were given 600 mg of mifepristone; the majority (66 percent) were given an injection of 0.25 mg of the prostaglandin sulprostone, five percent were given 0.375 mg, 19 percent were given 0.50 mg and 10 percent were given a 1.0 mg vaginal suppository containing gemeprost, a different prostaglandin. The participants averaged 29 years of age and had been amenorrheic for a mean of 44 days.

Overall, 96 percent of the women aborted successfully using mifepristone and the prostaglandin. Two percent had an incomplete abortion and subsequently needed vacuum aspiration to remove retained products of conception; one percent were unaffected by the drug and subsequently obtained surgical abortions. The remaining one percent experienced such severe uterine bleeding that vacuum aspiration or curettage had to be used to bring it under control. (Of these 18 women, four needed such treatment before receiving the prostaglandin; one had to have a blood transfusion.) The drug's efficacy was highest among women who were given the 0.50 mg injection of sulprostone (98.7 percent) and lowest among those given the 0.25 mg injection (95.7 percent).

Of the women who had a successful abortion, 86 percent experienced a complete abortion within 24 hours of receiving the dose of prostaglandin. Among those who were given an injection of 0.50 mg sulprostone, the abortion took an average of only 4.5 hours, compared with a mean of 19.3 hours among those who received 0.25 mg of sulprostone and 22.7 hours among those who were given the gemeprost suppository. Likewise, the percentage of women who aborted within four hours of taking the prostaglandin was significantly higher among those who were given 0.50 mg of sulprostone (87 percent) than among those who received 0.25 mg of sulprostone (55 percent) or a gemeprost suppository (46 percent).

Nearly every woman bled after treatment, regardless of the eventual success or failure of the procedure. Uterine bleeding lasted an average of 8.9 days, and the median duration was 8.0 days. The mean length of bleeding was greatest among the women who received the largest dose of sulprostone (11.8 days) and shortest among those who were given gemeprost suppositories (7.0 days).

A low of 73 percent of those who were given the gemeprost suppositories reported experiencing pain within the first few hours of taking the prostaglandin, compared with a high of 93 percent of those who received an injection of 0.375 mg of sulprostone. This pain was most intense among the women who were given the highest doses of prostaglandin. In addition, those who were given 0.50 mg of sulprostone were far more likely to need a painkiller (51 percent) than were those who had used the gemeprost suppository (21 percent) or the 0.25 mg injection of sulprostone (15 percent). Thirty-four percent of all participants experienced nausea after prostaglandin administration, 15 percent vomited and seven percent had diarrhea. The researchers comment that "these side effects were usually mild and did not necessitate any treatment."

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*Although only two visits are necessary for the actual procedure (one visit for the woman to take an oral dose of mifepristone, another one two days later for the prostaglandin), French law and medical practice have added two more visits to the process. Because of the mandated one-week reflection period before an abortion, a woman must report to the clinic once for registration a week before her first medical visit; in addition, all clients having a nonsurgical abortion are requested to return for a check-up 8–12 days after having received the mifepristone.

The investigators point out that the treatment's efficacy tended to be higher, and that abortion occurred faster, among the women who were given 0.50 mg of prostaglandin, a finding that needs to be confirmed in a controlled prospective study. However, pain associated with the procedure, the duration of bleeding and the need for analgesia were also greater at the higher dosages of prostaglandins.

"The efficacy of the combination of mifepristone and a prostaglandin analogue . . . makes it comparable with vacuum aspiration for the termination of pregnancies at the same stage," the researchers conclude, and the incidence of heavy bleeding was "no more frequent than [with] vacuum aspiration." They caution, though, that the risk of bleeding is enough that the procedure should be carried out only under medical supervision and that women using it should have immediate access to adequate medical facilities.

An editorial accompanying the research report observes that until now, the manufacturer of mifepristone, Roussel-UCLAF, has strictly limited the drug's availability to France. However, with the very positive results reported in the French study, Roussel may make the drug available soon in Great Britain and Scandinavia, where extensive testing of mifepristone has been carried out.[3] Indeed, Roussel announced in May that it would soon ask regulatory agencies in those countries to approve mifepristone for use there.[4] Nevertheless, the editorial also points out that because of dissension over abortion, problems of liability insurance and regulatory roadblocks, it is unlikely that mifepristone will be available in the United States in the near future.—*M. Klitsch*

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Rates of Pelvic Inflammatory Disease in England Increase by 28 Percent in the 1975–1985 Period

The incidence of pelvic inflammatory disease (PID) in England appears to have risen by 28 percent from 1975 to 1985, according to an analysis of data on patients discharged from public hospitals.[1] The increase in rates for both chronic and acute forms of PID was greatest among women in their 20s, the age-group most likely to have been hospitalized with PID. Although infertility occurred in only a very small proportion of all cases, it still was the most common specific condition accompanying the diagnosis of PID over the study period.

Hospital records of women discharged with diagnoses of PID were obtained from the Office of Population Censuses and Surveys. The data were collected in the Hospital Inpatient Enquiry, a survey based on a 10 percent sample of discharges from and deaths in public hospitals. Cases in which PID was not primary but related to another condition or event were excluded from the present analysis. Age-standardized rates were calculated for women aged 15–44, based on the standard female population in England in 1981.

Total discharge rates for PID increased by 28 percent over the study period, from 124.6 per 100,000 women aged 15–44 in 1975 to 159.3 per 100,000 in 1985. Patterns in discharge rates varied according to diagnosis of either acute (65 percent of cases) or chronic (35 percent of cases) forms of the disease. For example, discharge rates for acute PID fell between 1975 and 1979 (from 84.6 per 100,000 to 79.2 per 100,000), but then rose again from 1980 to 1985 to reach 105.8 per 100,000 in that year. However, discharge rates for chronic PID rose steadily over the period, going from 40.0 per 100,000 in 1975 to 53.5 per 100,000 in 1985.

Rates of acute PID, which increased by one-half (from 125.6 per 100,000 to 189.0 per 100,000), were highest among 20–24-year-olds. Compared with rates of chronic PID, rates of acute PID tended to be highest among the younger women. For example, while the rates of chronic PID in 1985 were 17.0 per 100,000 among 15–19-year-olds and 57.3 among 20–24-year-olds, the rates for acute PID in the same age-groups were 113.0 and 189.0, respectively. For chronic PID, discharge rates were highest among 25–29-year-olds, and increased by 41 percent, from 53.5 per 100,000 in 1975 to 75.7 per 100,000 in 1985. Moreover, for women older than age 35, discharge rates from public hospitals increased much more rapidly for chronic PID than for acute PID.

Divorced women were more likely to have been discharged from a hospital with PID (267.9 per 100,000) than were either single women (135.3 per 100,000) or married women (128.8 per 100,000). It should be pointed out, however, that many women in stable monogamous relationships were undoubtedly included in the single and divorced categories.

Aside from nonspecific pain, infertility was the most common single condition coded as accompanying a diagnosis of PID. However, the proportion of such cases rose only slightly over the study period, from 3.4 percent in 1975 to 4.6 percent in 1985. According to the authors, the marked increase in the proportion of cases associated with IUD use, which rose from 0.8 percent to 3.6 percent, was partly due to the new coding system that was introduced in 1979. Before that year, only cases in which the IUD was removed were coded. Since then, the coding system has included all cases in which an IUD was present and any cases in which there were complications as a result of the presence of the device.

Because clinical diagnosis of PID is unreliable and infection can occur with few or no symptoms, a surgical confirmation is often needed. A higher proportion of chronic PID cases were surgically confirmed in 1985 than in 1975—84 percent vs. 66 percent. However, surgical confirmation of acute cases did not increase. Overall, the use of laparoscopy instead of more invasive surgery to confirm diagnoses became steadily more common over the study period, increasing from 22 percent of surgically confirmed cases in 1975 to 54 percent in 1985. The data also indicate that the mean length of hospital stay among all age-groups declined over the period, falling from 7.6 days in 1975 to 4.1 days in 1985.

The authors advise that several factors be taken into account when interpreting these hospital discharge data, including the following: there may be statistical variation because a 10 percent sample size was used each year; the data refer to episodes of PID rather than to individuals; and the

International Classification of Disease coding system changed over the period. Furthermore, the authors observe that their rates probably underestimate the true risk of hospitalization for PID because there are no data from private hospitals and because discharge rates were calculated on the basis of all women aged 15–44 being equally at risk. They also acknowledge that the inherent difficulty in diagnosing PID contributes to the uncertainty of the data.

The increase in discharge rates for chronic PID may be explained by the rise in the proportion of cases that were surgically confirmed. The same explanation, however, would not apply to acute PID, since surgically confirmed diagnoses of this form of the disease did not increase over the review period. Moreover, the fact that more women are seeking infertility treatment may have influenced the increased rate of diagnosis of chronic PID. The authors conclude that the evidence of greater incidence of PID might have "important implications with respect to future demand for hospital services, particularly for treatment of infertility."—*L. Remez*

Reference

1. H. Buchan and M. Vessey, "Epidemiology and Trends in Hospital Discharges for Pelvic Inflammatory Disease in England, 1975 to 1985," *British Journal of Obstetrics and Gynaecology*, 96:1219, 1989.

Hispanic Fertility Rate 40 Percent Higher Than Rate of Non-Hispanics

As of 1988, more than 19 million men and women of Hispanic background were living in the United States, about one-third more than the number reported in the 1980 census.[1] According to data from a nationally representative survey, three out of five U.S. Hispanics are of Mexican descent, and the vast majority of all Hispanic residents of the United States live in the southwestern states. Hispanic women have children at a rate approximately 40 percent higher than that of non-Hispanics, although the fertility rates of the more highly educated women are virtually the same as those of non-Hispanics. In addition, Hispanics are generally poorer than non-Hispanics, with a lower median family income and a greater likelihood of living below the poverty line.

The Current Population Survey (CPS), conducted monthly by the U.S. Bureau of the Census, provides detailed information on the characteristics of U.S. residents. The supplement on the Hispanic population in the March 1988 CPS reveals that of more than 241 million people living in the United States at that time, 19.4 million (8.1 percent) were Hispanic. This total represents a 34 percent increase from the number of Hispanics identified in the 1980 census. About half of the rise was attributed to immigration and the remainder to natural increase. In contrast, the non-Hispanic population of the United States increased by less than seven percent over the same period of time.

The CPS data also indicate that 62 percent of all Hispanic men and women are Mexican, 13 percent are Puerto Rican, 12 percent are Central or South American, five percent are Cuban and the remaining eight percent are of other backgrounds. The Mexican-American population of the United States grew by 40 percent between 1980 and 1988, more rapidly than any other Hispanic group; the Cuban-American population increased by 30 percent over the same period and the Puerto Rican population by 25 percent.

Sixty-three percent of this country's Hispanic people live in the Southwest, with 55 percent residing in California and Texas. Four other states have 26 percent of the nation's Hispanic population, with 11 percent in New York, eight percent in Florida, four percent in Illinois, three percent in New Jersey and 11 percent in the remaining 41 states.

As of 1988, 51 percent of all Hispanics over age 25 had completed high school, the highest such level ever recorded among Hispanic residents of the United States. Nonetheless, this proportion remains substantially lower than the level of high school completion among non-Hispanics (78 percent). However, younger Hispanic respondents (those 25–34 years of age) are substantially more likely than older Hispanics to have completed high school (62 percent vs. 44 percent), indicating a better educated Hispanic population in the future. Hispanics over age 25 are only about half as likely as non-Hispanics to have completed college (10 percent vs. 21 percent).

Fertility data collected in the June 1988 CPS reveal that in the preceding year, the birthrate among Hispanic women was substantially greater than that of non-Hispanic women (94.0 and 67.6 births per 1,000 women, respectively). In general, Hispanic women represent eight percent of all U.S. women but have 11 percent of the births. The fertility differential between Hispanics and non-Hispanics is clear at all ages, but is largest among 35–39-year-olds (67.5 and 31.1 births per 1,000 women, respectively) and is smallest among 30–34-year-olds (89.4 and 80.9 per 1,000, respectively). The differential by education is largest among women who are not high school graduates (126.5 births per 1,000 Hispanic women vs. 75.0 births per 1,000 non-Hispanic women) and smallest among those who have been to college (66.8 per 1,000 vs. 61.7 per 1,000). In fact, among college graduates, Hispanic fertility is substantially lower than non-Hispanic fertility (37.4 per 1,000 vs. 63.9 per 1,000). Similarly, fertility among Hispanic residents of nonmetropolitan areas is lower than that among comparable non-Hispanics (58.2 per 1,000 vs. 75.1 per 1,000).

There were 3.8 people in the average Hispanic family in 1988, slightly higher than the mean total (3.7) in 1982; among non-Hispanic families, in contrast, the mean number of family members fell from 3.2 in 1982 to 3.1 in 1988. As in society in general, single-parent families became increasingly common among U.S. Hispanics during the 1980s. Between 1982 and 1988, the proportion of Hispanic families headed by a single parent (either male or female) rose from 26 percent to 30 percent; among non-Hispanic families, the comparable increase was from 18 percent to 20 percent. Single-parent families are more common among Puerto Ricans (48 percent) than among Mexicans (26 percent) or other Hispanics (30 percent).

Although Hispanic women are less likely than Hispanic men to be working (52 percent vs. 79 percent), the likelihood that Hispanic women would be in the civilian labor force increased during the decade (from 48 percent in 1982), while the participation of Hispanic men in the labor force decreased (from 81 percent in 1982). Thus, the gender gap in labor-force participation narrowed somewhat during the 1980s. Levels of male and female employment among Hispanics were similar to those seen in the U.S. non-Hispanic population.

In 1988, the median family income of Hispanics ($20,300) was substantially lower than that of non-Hispanics ($31,600), and since 1982, median income has grown less rapidly among Hispanics (seven percent compared with 12 percent). In addition, as of 1987, 26 percent of Hispanic families had an income below the federally designated poverty level, compared with just 10 percent of non-Hispanic families. This proportion was highest among Puerto Ricans (38 percent) and lowest among Cubans (14 percent).—*M. Klitsch*

Reference

1. U.S. Bureau of the Census, "The Hispanic Population in the United States: March 1988," *Current Population Reports*, Series P-20, No. 438, 1989.

Women Who Use the Pill May Be at Increased Risk Of Primary Liver Cancer

Oral contraceptives may increase the risk of primary liver cancer for young women who otherwise would be expected to be at low risk for the disease, according to a recent study.[1] If the pill does have such an effect, it is probably an initiating one rather than a promoting one because the vast majority of the study subjects with liver cancer had stopped using the pill at least eight years before they were interviewed. Nevertheless, despite the large number of women under age 50 in the United States who have taken the pill at some time and would therefore be expected to be at increased risk of liver cancer, the disease remains very rare in that age-group.

Women with liver cancer were identified as part of a case-control study conducted at 17 hospitals in five U.S. cities* from 1977 through 1985. In that study, nurses trained as interviewers collected medical and reproductive data, including information on timing and duration of oral contraceptive use, from patients with recently diagnosed cancers and from other patients on the medical, surgical and orthopedic wards of the same hospitals. Five percent of the patients who were approached refused to participate.

Fifteen of the women who were interviewed had been diagnosed with primary liver cancer within the preceding year and had no other primary cancer or history of the disease. Three of them were excluded from the present analysis because they were age 60 or over and thus would have had little or no opportunity to use oral contraceptives. Of the 12 remaining women (all 19–54 years old), nine had hepatocellular cancer, two had cholangiocarcinoma and one had a liver cancer of undetermined type. None had a history of hepatitis, but one woman with hepatocellular cancer was found during surgery to have cirrhosis of the liver.

Controls were selected from among 3,665 interviewed patients who did not have cancer and whose conditions were judged to be unrelated to oral contraceptive use. Five controls were matched to each cancer patient on the basis of hospital location, date of interview and five-year age-group. Because heavy alcohol consumption increases the risk of liver disease, the researchers also compared the drinking habits of cases and controls in the year prior to hospitalization, but found no appreciable difference between the two groups.

Eight of nine women with hepatocellular carcinoma had taken oral contraceptives (89 percent), compared with 16 of 45 controls (36 percent). Seven of the nine cases (78 percent) had taken the pill for at least two years, and three had done so for at least five years (33 percent); among the 45 controls, the corresponding proportions were 20 percent and 11 percent, respectively. The relative risk of hepatocellular cancer, both among women who had used oral contraceptives for 2–4 years and among those who had taken the pill for five or more years, was 20 times the risk among those who had done so for under two years. Among the women who had taken oral contraceptives in the past or were taking them at the time of the study, the median duration of use was 35 months for the cases and 36 months for the controls. Seventy-one percent of users among the cases and 69 percent of those among the controls had stopped taking oral contraceptives eight or more years before they were interviewed.

According to the investigators, "the present findings suggest that oral contraceptive use increases the risk of hepatocellular carcinoma." However, these data must be interpreted with caution because of the small number of cases involved. Most of the oral contraceptive users with hepatocellular carcinoma had stopped using the pill years before their diagnosis, which indicates that if the pill does have a carcinogenic effect, it is likely to be an initiating one rather than a promoting one. There was no evidence that pill formulation or duration of use has an effect; furthermore, no inferences could be drawn about the relationship of pill use to type of liver cancer, because only two cases of cholangiocarcinoma were found.

The investigators observe that liver cancer is extremely rare among U.S. women younger than 50, even though many of them have used oral contraceptives at some time; therefore, if there is a causal connection between pill use and liver cancer, "the actual number of cases of liver cancer . . . attributable to oral contraceptives is small." They add that the disease is much more prevalent in other parts of the world, especially where infection with hepatitis B, a major cause of hepatic carcinoma, is common. They conclude, therefore, that these findings "do not have public health importance in the United States and other Western nations."—*F. Althaus*

Reference

1. J. R. Palmer et al., "Oral Contraceptive Use and Liver Cancer," *American Journal of Epidemiology*, 130:878, 1989.

Majority of Adolescents In Detention Center Are Sexually Experienced

Eighty-three percent of adolescents admitted to a Florida juvenile detention center between 1981 and 1986 reported being sexually experienced.[1] Nearly 80 percent of black and nonblack females said they had had sexual intercourse by age 16, but rarely before puberty. Forty percent of black males and 20 percent of nonblack males reported that they had first had intercourse before age 10. Seventy-three percent of sexually experienced adolescents said they had had intercourse in the month prior to admission, and levels of recent sexual activity increased with age for all race-gender subgroups. Over one-quarter of the females reported that they had been forced to have sex at some time in their lives, compared with two percent of the males. The study suggests that prepubertal sexual activity is more common than is generally acknowledged, and that levels of sexual activity are generally high among delinquent adolescents.

Between May 1981 and September 1986, adolescents arriving at a detention center serving rural and suburban areas of North Central Florida were interviewed about their health histories. Of the 1,255 teenagers interviewed, 76 percent were male, ranging in age from 10 to 19. The number of males at each age, up to age 17, was greater than that of the previous age; only 10 males were under 12, and three percent were 18 or over. Forty-three percent of the males were black and 57 percent nonblack. (In this study, over 99 percent of "nonblack" adolescents were white.) Twenty-four percent of the entrants were female (36 percent black and 64 percent nonblack). Their age distribution was similar to the males, but none was under age 12.

The health histories revealed that 83 percent of the adolescents had had sexual intercourse; eight percent denied having had sexual intercourse, and 10 percent did not answer the question. Among the females, for each single year of age after 12, about 15–20 percent more than those of the previous age reported having had sexual intercourse, up to age 16, when almost 80 percent said they were sexually experienced. Only three percent of the females (four percent of nonblacks and three percent of blacks) reported having experienced coitus before age 10, and in eight of these ten instances, intercourse was reported to have been nonvoluntary. The males' sexual experience began substantially earlier, with 40 percent of blacks and 20 percent of nonblacks reporting that they had had sexual intercourse by age 10.

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*Baltimore, Boston, New York, Philadelphia and San Francisco.

Thirty-three percent of the adolescents reported having had intercourse during the week prior to entering the facility, and 73 percent said they had had intercourse within the previous month. Black males were more likely to report having had coitus within the prior week and month than were nonblack males, but their recent experiences did not differ significantly from those of black females. Furthermore, nonblack females were more likely to report having had intercourse during the previous week than were nonblack males. Rates of recent sexual activity increased steadily with age among the males, and did so among the females as well up to age 16, after which levels of recent sexual activity plateaued or lessened.

Over 25 percent of the females said they had been forced to have sex, compared with two percent of the males. Nonblacks of both genders reported nonvoluntary sexual activity slightly more often than blacks, but the differences were not statistically significant. The adolescents' willingness to discuss their sexual histories depended on the question, and increased with their age. No significant difference was found between race-gender subgroups in response to questions about their age at first coitus. When asked about their most recent sexual experience, almost twice as many females as males refused to answer. Males, on the other hand, refused to answer questions about nonvoluntary sex more than twice as frequently as females. Discomfort about discussing sexual assault or incest did not differ significantly by race for either gender.

Because of the large number of males claiming to have had sexual intercourse before puberty, the investigators argue that prepubertal sexual activity may be more common than is usually acknowledged. However, the interview data revealed a striking discrepancy in the responses of male and female adolescents concerning prepubertal sexual experience. It may be that males consider it more socially acceptable to report prepubertal, volitional sexual activity, that young males exaggerate their early sexual experience or that the young women at the juvenile detention center were not comparable to the males' early sexual partners. The researchers suggest that prepubertal sexual activity should be investigated further, as data on such behavior could affect the content and scheduling of sex education programs, particularly those geared to high-risk groups.—*R. Turner*

References

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Survey Finds Teenagers Know More About AIDS Than About Other STDs

Teenage students in the United States appear to be well-informed about AIDS and the transmission of the human immunodeficiency virus (HIV), according to a 1987 national survey of eighth and tenth graders, although some still have misconceptions about the risk of contracting the infection.[1] Students' knowledge of other sexually transmitted diseases (STDs) is more limited: Many are unable to identify early symptoms of STDs and do not know how to reduce their risk of becoming infected. More than one-third do not know where to get medical treatment for STDs, and half would have difficulty paying for such treatment. A majority of students believe that it is "okay" to have sex with a steady partner, but only 11 percent approve of having sex with several partners. Eighty-five percent believe that it is okay to "say no" to sex, and 91 percent think that condoms should be used by those who are sexually active.

The National Adolescent Student Health Survey (NASHS) is the first national survey since 1964 to assess the knowledge, attitudes and behavior of American teenagers regarding health and sex-related issues, including AIDS and other STDs, violence, suicide, injury prevention, nutrition and tobacco, alcohol and other drug use. The survey was conducted in the fall of 1987 among 11,419 students who were in eighth or 10th grade at one of 217 junior or senior high schools. (Responses were weighted to reflect national estimates by adjusting for the probability of selecting a particular county, school or student.) Fifty-one percent of the students were male and 49 percent were female; their ages ranged from 11 to 17, but the majority were either 13 or 15. Sixty-nine percent of the respondents were white, 17 percent were black and nine percent were Hispanic. Although four out of five teenagers reported having had at least one course in health education since beginning seventh grade, only about one-third reported having received instruction on either AIDS or other STDs. More 10th graders than eighth graders reported having had a health education course (87 percent vs. 72 percent).

According to the survey, more than 90 percent of all students know that the risk of contracting AIDS is increased by having sexual intercourse with someone who is infected with HIV or by sharing intravenous needles. Approximately 90 percent are also aware that AIDS is a fatal disease for which there is no cure, that condoms are effective in reducing the risk of transmitting the virus and that people their age should use condoms if they have sex. More than 80 percent believe that having more than one sex partner increases the risk of HIV infection, but that hugging someone with AIDS does not increase that risk.

On the other hand, many students have inaccurate beliefs regarding AIDS. Nearly half of those surveyed think that donating blood increases the risk of HIV infection, and nearly three-quarters believe that blood transfusion remains a common means of becoming infected. Although 81 percent of the students know that gay male sex partners are at increased risk of HIV infection, 59 percent think that lesbian sex partners are also at increased risk. Twenty-five percent believe that washing after sex reduces the chance of contracting the infection (26 percent do not know). Although 85 percent believe that there is no increased risk of HIV infection from being in a classroom with someone with AIDS, 27 percent report that they would worry about getting AIDS in this situation. The survey showed that female students are somewhat more likely to have accurate knowledge about the risks of HIV transmission; in general, more tenth graders than eighth graders have accurate knowledge about AIDS.

The NASHS also assessed student knowledge of other STDs, including herpes, gonorrhea and syphilis. Responses showed that students know far less about STDs in general than they know about AIDS. For example, 30 percent do not know that most people get these diseases by having sex, and 67 percent either believe or do not know whether washing after sex can prevent STD transmission. More than half of the students do not know that taking birth control pills is ineffective in avoiding STDs, and one-quarter do not know that using condoms is an effective means of prevention. One-third do not know that a sore on the genitals is a common early sign of an STD.

In addition, survey responses indicate many real and perceived barriers faced by teenagers in seeking treatment for STDs. Thirty-nine percent of students say that they would not know where to go for medical care if they thought they had an STD; 44 percent report that they would be embarrassed to ask a doctor what is wrong with them and 49 percent say that it would be hard for them to pay for treatment. Forty percent of students mistakenly believe that a public health department must inform parents about STDs in patients younger than 18 (36 percent do not know); 44 percent believe (again, mistakenly) that most clinics must have parental permission to treat patients under 18 (35 percent do not know). Even so, a clear majority of students indicate that getting tested (88 percent), telling their partner (77 percent) and abstaining from intercourse (67 percent) would be appropriate responses if they thought they might have an STD.

In general, female students are more likely than male students to have accurate information about STDs, and more often report that they have a friend they could talk to if they thought they had symptoms. However, females are also more likely to indicate that lack of transportation and money would prevent them from seeking care. In general, 10th graders have more accurate information than eighth graders about STDs; however, more 10th grade males than eighth grade males (48 percent vs. 37 percent) believe that washing after intercourse would be an effective way of avoiding infection. More 10th graders than eighth graders (44 percent vs. 33 percent) do not know an adult they could talk to if they had an STD, and 10th graders would be more likely than eighth graders to want to keep their parents from finding out (56 percent vs. 44 percent).

Males and 10th graders appear to have more lenient attitudes toward sex than do females and eighth graders. Overall, 62 percent of male adolescents and 43 percent of female adolescents believe that sex with a steady partner is acceptable, while 18 percent of males and four percent of females believe that sex with several partners is acceptable. A clear majority (94 percent of females and 76 percent of males) affirm a young person's right to "say no" to sex. More 10th graders than eighth graders believe that intercourse is acceptable with a steady partner (62 vs. 43 percent) or with several partners (14 vs. seven percent), but 10th graders are also somewhat more likely than eighth graders to favor the use of condoms (94 vs. 88 percent).

Besides measuring students' own attitudes toward sex, the NASHS measured perceived peer attitudes toward sex. (Questions began both with "I believe . . ." and with "My friends believe. . . .") Regardless of gender or grade level, students perceive their friends' attitudes toward sex as more permissive than their own. For example, although 76 percent of males and 94 percent of females believe it is all right to say no to sex, only 48 percent and 75 percent, respectively, believe their peers feel the same way. Similar drops are seen when students are compared by grade level. Overall, very few students believe that having intercourse with several different people is appropriate, yet approximately twice as many indicate that their friends think it is acceptable. There are smaller, but similar, differences between students' attitudes and what they perceive as their friends' attitudes toward sex with a steady partner and toward condom use. Fifty-three percent of the students surveyed say they approve of sex with a steady partner, while 64 percent say their friends approve. Furthermore, 91 percent think that condoms should be used, but just 80 percent believe their friends think so.

The investigators conclude that AIDS is generally well understood by American teenagers, probably as a result of intensive informational campaigns conducted at the national, state and local levels. However, they call for more complete education about STDs, improved access to and information about health care facilities, and a higher priority for health education and comprehensive sex education within the total school curriculum, beginning in the elementary grades.—*M. Witwer*

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Delays in Conception Found Among Women Who Had Used the Pill

Women who discontinue oral contraceptive use to become pregnant need nearly twice as much time to conceive as those who use nonhormonal methods of birth control.[1] Among a group of Connecticut women observed between 1980 and 1982, the mean time to conception for former oral contraceptive users was 5.9 menstrual cycles, compared with a mean of 3.2 cycles among women who had used other methods. Women who had taken oral contraceptives with higher doses of estrogen (50 mcg or more) had to wait longer to conceive than did those who had taken low-dose formulations (4.8 cycles vs. 4.0 cycles). Delays in conception after pill use remained for at least one year following discontinuation.

Data from the Yale Pregnancy Outcome study were used to identify 1,681 women who were currently married, who had stopped using birth control after their marriage and had conceived within 24 cycles of 28 days, and whose last method of contraception could be determined. A total of 281 women had last used the pill, while the remaining 1,400 had used methods including the IUD, spermicides, the diaphragm, rhythm, condoms, withdrawal and douches.

Among the pill users, 121 had taken formulations containing less than 50 mcg of estrogen, while 127 had taken formulations with 50 mcg or more. (Since the time of this study, the frequency with which pills containing 50 mcg or more of estrogen are dispensed has declined substantially.) Thirty-three pill users were excluded from the survey because their brand of pill could not be determined. The length of time required for conception was determined by the women's responses to questions about their birth control history and their estimate of the date of conception.

Among all women who conceived within 24 cycles, the mean length of time to conception was 3.6 cycles. However, the mean among women who had most recently used oral contraceptives (5.9 cycles) was significantly greater ($p<0.001$) than the mean among those who had used other contraceptive methods (3.2 cycles). Similarly, among all women who conceived within 12 cycles, the mean conception time was 3.1 cycles, but former pill users (4.4 cycles) needed significantly longer to conceive ($p<0.0001$) than did women using other methods (2.8 cycles). The mean time

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required for conception among women who had taken pill formulations with estrogen levels of 50 mcg or more (4.8 cycles) was also significantly greater ($p<0.05$) than among those who had used formulations with estrogen levels of less than 50 mcg (4.0 cycles). Both subgroups of pill users needed a significantly longer time to conceive than did those who had used other contraceptives ($p<0.001$); the difference in the time needed to conceive between the women who had used formulations with less than 50 mcg and the women who had used other methods was also significant ($p<0.001$).

Women with no prior pregnancies and those who had consumed alcohol during their pregnancy also needed a longer time to conceive, and for a small number of women a longer wait was associated with a history of medical problems. However, none of these differences were as large as those seen as a result of oral contraceptive use. Looking for associations between maternal characteristics and form of birth control used, the researchers found that women who had used the pill were usually younger, nonwhite, smokers, pregnant for the first time, less educated and nondrinkers, and that women who had used a pill formulation with less than 50 mcg of estrogen were significantly more likely to have consumed more than 0.25 mg alcohol per day than women who had taken oral contraceptives containing more than 50 mcg of estrogen.

The investigators also determined the probability of conception for each full cycle after the discontinuation of birth control methods. In the first full cycle (days 29–56) after discontinuation of methods other than the pill, the likelihood of conception was 0.28, compared with a probability of 0.23 after discontinuation of low-dose pills and one of 0.19 after discontinuing use of high-dose oral contraceptives. For women entering their 11th cycle, the respective probabilities of conception were 0.40, 0.34 and 0.28. The first cycle (days 0–28) was found to be significantly different from the others; the probability of conception after use of high-dose formulations was 0.19 and after use of low dose oral contraceptives was 0.24, compared with 0.35 among those women who had used other methods.

Finally, the researchers analyzed the link between fecundity and birth control method, controlling for possible confounding factors such as maternal age, smoking, race, alcohol consumption, education and previous pregnancies. Although there was still a major association between previous use of oral contraceptives and the length of time needed to conceive, the difference by type of formulation ceased to be statistically significant.

Oral contraceptives containing 50 mcg or more of estrogen are used infrequently today. However, the researchers conclude that the results of this study support the belief that oral contraceptives of any dose may have a residual effect of delaying conception.—*R. Turner*

Reference

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Folic Acid Supplementation During Early Pregnancy Appears To Lessen Risk of Neural Tube Defects

Women who take multivitamins containing folic acid during the first six weeks after conception may substantially lessen the risk that the gestating fetus will have a neural tube defect,* according to a recent study.[1] Folic acid supplementation appears to be particularly important when a woman has a family history of such defects: For such women, not taking folic acid in early pregnancy was associated with a rate almost three times higher than the rate associated with folic acid supplementation. However, the occurrence of neural tube defects was not affected by use of multivitamins without folic acid during the first six weeks of pregnancy or by folic acid supplementation after the first six weeks.

From October 1984 through June 1987, a total of 24,559 women who were screened prenatally by participating physicians were telephoned by trained nurse interviewers; 23,491 (96 percent) agreed to participate in the study. At the time they were screened, most were at 15–20 weeks of gestation. The investigators obtained completed interviews from all but 29 women; 686 more were excluded from the analysis because they could not be located at follow-up. The final sample of 22,776 women included 596 with a family history of neural tube defects (affecting either respondents themselves or their husbands, children, siblings, half-siblings, parents, aunts, uncles, nieces, nephews or first cousins). Of those 596 women, 107 had had a previous pregnancy in which the fetus had a neural tube defect.

The interviewers questioned the participants about their family, medical and genetic history, with an emphasis on diet, medication and illness during the first trimester of pregnancy. The women were asked to provide brand names of multivitamins and dosage and frequency of use of other nutritional supplements taken during the three months before and after they became pregnant.† When a woman reported having taken multivitamins or supplements during the first trimester, the investigators estimated in which week of pregnancy supplementation had begun, based on the date of the woman's last menstrual period. The women were also asked how frequently they had eaten each of 50 listed foods during the first eight weeks of their pregnancy, and their responses were used to calculate their dietary intake of folic acid.

A brief pregnancy outcome questionnaire was mailed to the delivering physician near the expected date of birth; if the physician did not respond, a copy of the questionnaire was sent to the woman herself. The questionnaire covered the results of prenatal tests, the presence of birth defects or chromosomal abnormalities, complications of pregnancy or delivery, health complications in the infant and perinatal illness in the mother. Of the 22,776 women for whom complete interview and pregnancy outcome data were available, 49 were carrying a fetus with one or more neural tube defects. There were five women with an affected fetus among 596 women who had a family history of such defects, and 44 women with an affected fetus among the 22,093 women who had no family history. Of the 49 women with an affected fetus, six gave birth to live infants, one had a spontaneous abortion and 35 had an induced abortion; the pregnancy outcome for seven others was not known.

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*The neural tube forms and closes during the first eight weeks of gestation. Failure of the neural tube to close properly may result in spina bifida, anencephaly or encephalocele.

†They were asked specifically about vitamins A, C, D and E, yeast, folic acid, selenium, zinc and iron.

Sixty-one women, none of whom were carrying a fetus with a neural tube defect, were excluded from the analysis because complete information about their use of multivitamins was lacking. A woman was considered a multivitamin user if she reported having taken a multivitamin at least once a week. Of the 22,715 women included in the analysis, 32 percent had used multivitamins both before and after conception, 54 percent had used them in the first trimester only, 13 percent had never taken them and one percent had used them only before conception. The investigators classified the latter group as nonusers. Among the users, 87 percent reported having taken supplements every day and 13 percent said they had taken them between one and six days a week.

Use of multivitamins both before and after conception was associated with a rate of 1.2 cases of neural tube defects per 1,000; the rates associated with use in the first trimester alone and with nonuse were 2.4 per 1,000 and 3.5 per 1,000, respectively. Taking multivitamins during the first six weeks of pregnancy was associated with a rate of 1.1 per 1,000, while use after the first six weeks was associated with a rate of 3.2 per 1,000.

Women who had taken multivitamins during the first six weeks of pregnancy were subdivided according to whether their vitamins had contained folic acid. The use of vitamins containing folic acid was associated with a rate of 0.9 cases of neural tube defects per 1,000, while use of vitamins not containing folic acid was associated with a rate of 3.2 cases per 1,000.

Next, the researchers estimated dietary folic acid intake for the 11,944 women who had not taken multivitamins containing folic acid. Daily folic acid intake of less than 100 mcg was associated with a rate of 7.3 cases per 1,000 and daily folic acid intake of 100 mcg or more was associated with a rate of 3.1 per 1,000.

Among women with a family history of neural tube defects, use of multivitamins containing folic acid during the first six weeks of pregnancy was associated with a rate of 3.5 per 1,000 and nonuse was associated with a rate of 13.0 per 1,000. Among women with no family history, use of folic acid was associated with a rate of 0.9 per 1,000 and nonuse was associated with a rate of 3.0 per 1,000.

Using logistic regression analysis to control for the number of previous pregnancies, family history of neural tube defects, maternal age and education, current smoking and dietary folic acid intake, the investigators found that the rate associated with use of multivitamins containing folic acid during the first six weeks of pregnancy was 70 percent lower than the rate associated with nonuse.

The investigators believe that the prevalence patterns of neural tube defects suggest "a genetic predisposition [that] interacts with an essential nutrient deficiency, possibly a deficiency of folic acid." Because the great majority of multivitamins containing folic acid also contain vitamins A, C, D and E, the researchers were unable to evaluate the independent effects of those vitamins. They conclude that their findings, taken with those of other studies, "provide good evidence that folic acid–containing multivitamins taken during the first six weeks of pregnancy will prevent, by more than 50 percent, the occurrence of neural tube defects."—*F. Althaus*

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For Low-Risk Deliveries, Birth Centers Offer Care Comparable to Hospitals'

Women at low risk of obstetric complications who have their babies at freestanding birth centers are no more likely to have poor birth outcomes or to require a cesarean section than are low-risk women who give birth in hospitals, according to research examining deliveries at 84 birth centers nationwide.[1] In addition, their babies appear to be at no higher risk of mortality. A study of 22 freestanding birth centers in California yielded similar findings.[2] More than 15 percent of the women and their babies in both studies, however, required transfer to hospitals either during labor or just after delivery.

The National Birth Center Study, conducted through the National Association of Childbearing Centers and Columbia University's School of Public Health, included 84 centers—53 percent of the 160 centers known to the association or to state health authorities in 1987. A total of 17,856 women were originally enrolled in the study, but one-third were referred to hospitals because of prenatal complications or discontinued care for other reasons; the final sample thus consisted of 11,814 low-risk women. Each participating center gathered prospective data on its clients, and asked the mothers to evaluate their own care. The California study used retrospective data on 3,915 women using 22 birth centers in that state in 1984 and 1985; 470 were referred to hospitals during the prenatal period, leaving a final sample of 3,445 patients.

Women using the birth centers were generally a low-risk group. Ninety percent of the women in the national study were 18–34, 32 percent had graduated from college and 25 percent were of low economic status. Seventy-eight percent were non-Hispanic whites, sixteen percent were Hispanic and four percent were black. Very few had smoked cigarettes or consumed alcohol during pregnancy. Only 12 percent of the women were unmarried, compared to 23 percent of all women giving birth in 1986. Similarly, the majority of women using the California centers were non-Hispanic whites, and the centers served a greater number of older, better educated women.

In the national study, certified nurse-midwives or students of nurse-midwifery were in attendance at 79 percent of labors and 81 percent of deliveries; obstetricians provided care during 10 percent of the labors and 16 percent of the deliveries. In contrast, 74 percent of deliveries at California birth centers were attended by obstetricians, and only six percent by certified nurse-midwives.

Only one percent of the women in the national study had labor induced in a birth center. Eleven percent of the women were diagnosed as having failed to progress sufficiently, but rather than inducing labor in these cases, the centers transferred most of these women to hospitals. Forty-two percent of the women who delivered at a birth center were given some treatment to augment labor. Thirty-two percent needed to have their membranes artificially ruptured, eight percent required nipple stimulation and only one percent received oxytocin. Ninety-nine percent of the women had spontaneous vaginal deliveries; vacuum extraction or forceps were needed in only a few of the deliveries.

Eight percent of the mothers or their infants experienced one or more serious complications during or after delivery. However, the centers only transferred 47 percent of these women or their infants to hospitals. The investigators explain that when serious complications arise close to birth, there may not be time to transfer the mother or infant, and that a transfer may not be necessary once the crisis has been attended to.

Sixteen percent of mothers or their babies in the national study were transferred to a hospital during or soon after labor and

DIGEST

delivery, most frequently because of the failure to progress (58 percent), meconium in the amniotic fluid (13 percent) and fetal distress (10 percent). Only one percent of the women in the national study were transferred postpartum, usually because of hemorrhage or retained placenta, while two percent of newborns were transferred, most frequently because of respiratory distress. Of the 3,151 births initiated at California birth centers in 1984 and 1985, there were 294 intrapartum transfers to hospitals, eight postpartum transfers of mothers and 49 neonatal transfers.

The national study showed an association between nulliparity and the likelihood of being transferred to a hospital: Twenty-nine percent of nulliparous women or their infants were transferred, compared with seven percent of parous women or their babies. Furthermore, 15 percent of all 4,610 women pregnant for the first time were transferred due to failure to progress, compared with only two percent of 7,121 parous women.

The cesarean section rate in the national study was four percent, with rates of 10 percent among nulliparous women and less than one percent among parous women. Sixty-five percent of cesarean sections were performed because of failure to progress, 16 percent because of fetal distress, 16 percent because of meconium in the amniotic fluid and five percent because of a nonvertex presentation. (Some of these situations overlapped.) Of the 1,405 women transferred to hospitals during labor, 37 percent had cesarean sections. In the California study, the cesarean section rate was four percent of total admissions and 52 percent of the hospital transfers in 1984, and six percent of total admissions and 67 percent of such transfers in 1985.

There were no maternal deaths among participants in either study. Among the 11,826 births in the national study, 15 babies died during delivery or neonatally, seven of them because of lethal congenital anomalies. Excluding the latter deaths, the combined mortality rate for delivery and the neonatal period was 0.3 deaths per 1,000 births. In the California centers, the neonatal mortality rate in 1984 and 1985 was 0.6 percent per 1,000 births.

In the national study, 24 percent of the nulliparous women and six percent of the parous women at the birth centers were given an analgesic, tranquilizer or sedative during labor. Three percent of the women were given anesthetics other than those routinely given for an episiotomy or repair of laceration. In 87 percent of the women, fetal heart rate was monitored by portable Doppler ultrasonography. While in labor, 43 percent took showers or baths, all but five percent ate or drank, and 97 percent were accompanied by friends or family, often including young children. Forty-three percent of the participants gave birth in an upright or semi-upright position (38 percent sitting, four percent standing), 29 percent on their sides, and 21 percent lying down.

Seventy-six percent of the women participating in the national study and who were not transferred completed evaluations of their care. Ninety-nine percent of these women said they would recommend the birth center to friends; 94 percent said they would use the facility again for another pregnancy. Among women who underwent transfers, 54 percent filled out evaluations; 97 percent indicated that they would recommend the birth center, and 83 percent said they would return to the center for another birth. In addition, 83 percent of the participants in the national study returned to the birth center for a postpartum visit. Of those women who did not, all but 26 of their babies were known to be healthy at discharge from the birth center or hospital.

One problem in assessing the safety of freestanding birth centers is the difficulties of creating an appropriate control group. The National Birth Center study compared its outcomes to those of other low-risk hospital births and found that its proportion of low Apgar scores and intrapartum and neonatal infant mortality rate were in the same range; furthermore, the birth centers' cesarean section rate was about half that of hospital births. Still, all those studies provide information about only low-risk women; it is unclear what birth outcomes would be like for higher risk women. Another problem with the national study is that since half of the birth centers known to the national association participated, there is no way of knowing the safety of births that took place in the other centers. For example, the nonparticipating birth centers were less likely than the others to have been either licensed or accredited. Nonetheless, the data in both the National Birth Center Study and the California study suggest that freestanding birth centers are able to provide comparatively safe care for low-risk women in an out-of-hospital environment.—*R. Turner*

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Abortion Services in the United States . . .

(Continued from page 108)

productive Health Services. Women in many parts of the country have to travel long distances to obtain abortions, and those who manage to overcome such obstacles are likely to have their abortions later in pregnancy, when the health risks are greater.

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Books in Review

Complex Analyses, Personal Decisions

Choosing a Contraceptive: Method Choice in Asia and the United States
ed. by Rodolfo A. Bulatao, James A. Palmore and Sandra E. Ward, Westview Press, Boulder, Colo., 1990, $38.50, 313 pp.

Reviewed by Barbara Entwisle

Why do couples choose particular contraceptive methods? This question prompted a seminar on the determinants of contraceptive choice, at the East-West Population Institute in August 1985. Consistent with the Institute's regional orientation, seminar papers focused on Asia and, to a lesser extent, on the United States. *Choosing a Contraceptive* contains revised versions of these papers.

As James A. Palmore and Rodolfo A. Bulatao point out in the introductory chapter, Asia provides a highly varied context for investigating method choice. Prevalence ranges from less than 10 percent in Pakistan and Nepal to 70 percent and higher in Hong Kong, Korea, Taiwan and Singapore. Method mix differs across regions as well: Female sterilization, male sterilization, the pill, the IUD and condoms are each the most popular method in at least one Asian country. Even within countries, it is rare to find the majority favoring a single method (China, India and Japan are the exceptions), and it is not unusual to find three or four methods each accounting for 15 percent or more of use. Method mix in Asia has also changed rapidly over time; the predominant trend has been a shift to more effective methods.

The editors divide the book into three sections. The first part provides psychological, social, spatial and economic perspectives on method choice, and gives an overview of selected models for analyzing decision-making, including some not yet applied to research on contraceptive choice and others still under development for this purpose. The second part presents a series of case studies from Bangladesh, India, Korea, Peninsular Malaysia, Sri Lanka and Thailand, and the third examines method choice in the United States. The introductory and concluding chapters review findings and offer organizing frameworks, helping to integrate the diverse material. In addition, the editors combine bibliographic references into a single listing and provide a unified index (all too rare in edited books).

The foreword and introductory chapter state that the volume is intended for policymakers and program managers as well as scholars. Whether the book can satisfy both audiences is open to question, though, since the study of method choice necessarily involves the use of complicated statistical techniques unfamiliar to readers who are not technical specialists. Despite laudable attempts to make results accessible to a general audience—by including sections on predicted probabilities, for example—it seems unlikely that the nonscholarly audience will read more than the introductory and concluding chapters.

Many contributors speak directly to the interests of policymakers and program managers, applying sophisticated but appropriate statistical techniques to questions of definite relevance to them. Several studies examine the effects of specific program strategies; two deserve special praise. In a study of the effects of outreach workers on contraceptive decision-making in rural Bangladesh, James F. Phillips and colleagues found that contact with female outreach workers increases the likelihood that women will use contraceptives more than contact with male workers does; this increase mainly involves methods dispensed in client homes, although the likelihood of sterilization increased as well. Another chapter discusses the sensitivity of users in the Philippines, Jamaica and Thailand to prices of particular contraceptive methods. The investigators in this study, J. Brad Schwartz and coauthors, found that price has a small but negative effect on choice of method (except for condoms). However, the study does not determine the effect of charging for contraceptives previously provided for free—information that is crucial to drawing any conclusions about subsidization.

Three other studies address aspects of the service environment explicitly: a study on the interaction between clinic availability, respondent education and reproductive desires in Peninsular Malaysia; a comparison of travel time to the source of a particular method and to sources of alternative methods in the Philippines and Egypt; and a pilot study of physicians' perceptions of the pill and three variants of the rhythm method in Mauritius, Peru, the Philippines and Sri Lanka. In addition, awareness of government services is included as one of the covariates of method choice in an analysis of Korean contraceptive practices.

Lessons for policymakers and program administrators can, of course, be drawn from studies that do not include a specific policy variable. A good example is the chapter by Ronald R. Rindfuss and associates that examines life cycle, background and current characteristics as predictors of contraceptive choice among white, non-Hispanic women in the United States using National Survey of Family Growth data from 1976 and 1982. One of these authors' most compelling findings was that the change in method-mix between 1976 and 1982, when pill and IUD use dropped dramatically, was not due to compositional changes in the population of contraceptive users but rather may have been the result of adverse publicity concerning medical risks of those methods, a possibility with

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clear policy relevance. Unfortunately, the authors' decision to group methods, distinguishing effective noncoital methods (pill and IUD) from less effective and coitus-related ones, tends to diminish the usefulness of their results for this purpose.

For the most part, contributors to the volume focus on method choice within countries. An exception is the concluding chapter, which tries to account for variation between as well as within countries. To explain why condoms are more popular in Japan (78 percent of all use in 1984) than in any other country, Bulatao points to the reliance of Japanese women on their husbands for contraceptive information (especially early in marriage), the women's purported indifference to sex, the limitations the medical establishment places on obtaining other methods and the availability of abortion as a back-up. These are interesting hypotheses, worth following up. Most contributors consider choices between two or more contraceptive methods, but two chapters do focus on particular methods—one on traditional methods in Sri Lanka and another on sterilization in the United States. The U.S. analysis is problematic in many respects, however, particularly in the questionable application of a computer program for maximum likelihood estimation procedures to a 14-equation system in which many of the dependent variables are dichotomous.

Taken together, the chapters represent an impressive body of work on contraceptive method choice. Certain unresolved issues become evident, some of which are acknowledged: the differences between the sterilization decision and other contraceptive decisions, the problems of selectivity caused by excluding sterilized women from analysis, reasons for omitting fertility intentions from model specifications, the importance of expanding the set of choices to include no contraceptive use and assumptions about decision-making that underlie the analysis of choice.

The book also offers some hints about future research directions. For example, the observation that women make choices about sources as well as methods, and that one may be contingent on the other, is a potentially fruitful subject for study. One contributor hypothesizes that effects of travel time on method choice in Egypt may be explained by the fact that women living close to a source may opt for methods requiring resupply more often, whereas women living farther away from sources choose methods that do not require frequent visits. Expansion of the decision-making model to include both method and source choices seems a worthwhile next step. Mixed multinomial logit models, which consider characteristics of a choice as well as of the individual making that choice, also hold promise, since variation in efficacy, cost, reversibility and potential for side effects undoubtedly affects decisions about particular methods. This approach is illustrated in the analysis of prices and method choice in Jamaica, the Philippines and Thailand. Finally, as appropriate data become available, the study of contraceptive method choice may become part of a broader study of contraceptive use dynamics.

An Assessment of Contraceptive . . .

(Continued from page 127)

these methods at lower cost from subsidized clinics than the price they paid at retail outlets.

Previous research has demonstrated that birthrates are lower in areas where a higher proportion of the at-risk population is served by family planning clinics.[22] Use of these facilities by greater numbers of low-income women at risk of unwanted pregnancy would also raise the educational level regarding fertility and contraception, thus increasing the awareness of risk, and would enable such women to use contraceptives more effectively at a lower cost.

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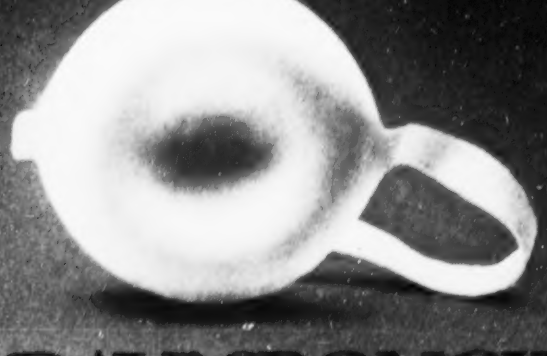

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Family Planning Perspectives

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Impact of Contraceptive Funding in California

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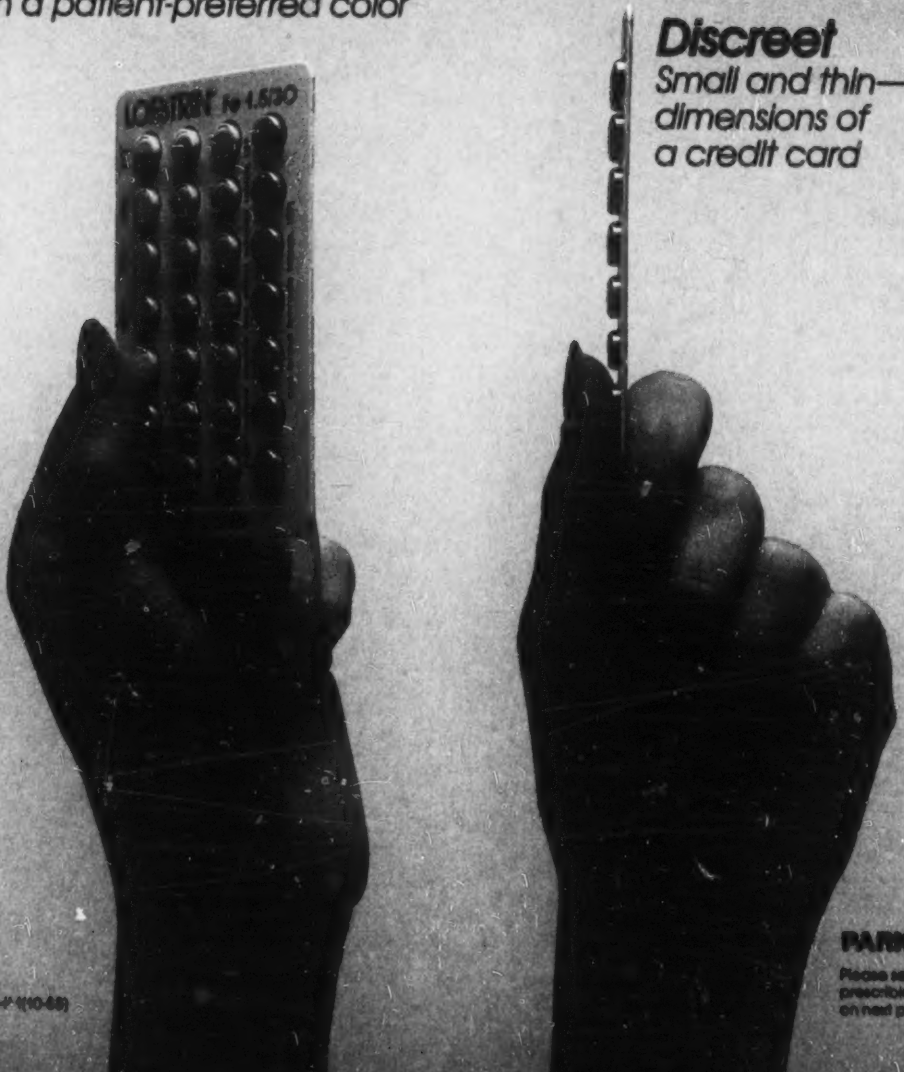
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INDICATIONS AND USAGE: Loestrin 21 and Loestrin Fe are indicated for the prevention of pregnancy in women who elect to use oral contraceptives (OCs) as a method of contraception. **Dose-Related Risk of Thromboembolism from Oral Contraceptives:** Two studies have shown a positive association between the dose of estrogens in oral contraceptives and the risk of thromboembolism. For this reason, it is prudent and in keeping with good principles of therapeutics to minimize exposure to estrogen. The OC product prescribed for any given patient should be that product which contains the least amount of estrogen that is compatible with an acceptable pregnancy rate and patient acceptance. It is recommended that new acceptors of OCs be started on preparations containing 0.05 mg or less of estrogen. **CONTRAINDICATIONS:** OCs should not be used in women with any of the following conditions: 1. Thrombophlebitis or thromboembolic disorders; 2. A past history of deep vein thrombophlebitis or thromboembolic disorders; 3. Cerebral vascular or coronary artery disease; 4. Known or suspected carcinoma of the breast; 5. Known or suspected estrogen-dependent neoplasia; 6. Undiagnosed abnormal genital bleeding; 7. Known or suspected pregnancy (see Warning No. 5); 8. Benign or malignant liver tumor which developed during the use of oral contraceptives or other estrogen-containing products.

WARNINGS

> **Cigarette smoking increases the risk of serious cardiovascular side effects from oral contraceptive use. This risk increases with age and with heavy smoking (15 or more cigarettes per day) and is quite marked in women over 35 years of age. Women who use oral contraceptives should be strongly advised not to smoke.**
>
> The use of oral contraceptives is associated with increased risk of several serious conditions including thromboembolism, stroke, myocardial infarction, hepatic adenoma, gallbladder disease, and hypertension. Practitioners prescribing oral contraceptives should be familiar with the following information relating to these risks.

1. *Thromboembolic Disorders and Other Vascular Problems.* An increased risk of thromboembolic and thrombotic disease associated with the use of OCs is well established. Three principal studies in Great Britain and three in the United States have demonstrated an increased risk of fatal and nonfatal venous thromboembolism and stroke, both hemorrhagic and thrombotic. These studies estimate that users of OCs are 4 to 11 times more likely than nonusers to develop these diseases without evident cause. **Cerebrovascular Disorders:** In a collaborative American study of cerebrovascular disorders in women with and without predisposing causes, it was estimated that the risk of hemorrhagic stroke was 2.0 times greater in users than in nonusers and the risk of thrombotic stroke was 4 to 9.5 times greater in users than in nonusers. **Myocardial Infarction:** An increased risk of myocardial infarction associated with the use of OCs has been reported, confirming a previously suspected association. These studies, conducted in the United Kingdom, found, as expected, that the greater the number of underlying risk factors for coronary artery disease (cigarette smoking, hypertension, hypercholesterolemia, obesity, diabetes, history of preeclamptic toxemia), the higher the risk of developing myocardial infarction, regardless of whether the patient was an OC user or not. OCs, however, were found to be a clear additional risk factor. In terms of relative risk, it has been estimated that OC users who do not smoke (smoking is considered a major predisposing condition to myocardial infarction) are about twice as likely to have a fatal myocardial infarction as nonusers who do not smoke. OC users who are also smokers have about a 5-fold increased risk of fatal infarction compared to users who do not smoke, but about a 10- to 12-fold increased risk compared to nonusers who do not smoke. Furthermore, the amount of smoking is also an important factor. In determining the importance of these relative risks, however, the baseline rates for various age groups must be given serious consideration. The importance of other predisposing conditions mentioned above in determining relative and absolute risks has not as yet been quantified; it is quite likely that the same synergistic action exists, but perhaps to a lesser extent. **Risk of Dose:** In an analysis of data derived from several national adverse reaction reporting systems, British investigators concluded that the risk of thromboembolism, including coronary thrombosis, is directly related to the dose of estrogen used in oral contraceptives. Preparations containing 100 mcg or more of estrogen were associated with a higher risk of thromboembolism than those containing 50 to 80 mcg of estrogen. Their analysis did suggest, however, that the quantity of estrogen may not be the sole factor involved. This finding has been confirmed in the United States. Careful epidemiological studies to determine the degree of thromboembolic risk associated with progestogen-only OCs have not been performed. Cases of thromboembolic disease have been reported in women using these products, and they should not be presumed to be free of excess risk. **Persistence of Risk:** In confirmation of earlier reports, two studies have suggested that an increased risk may persist for as long as 6 years after discontinuation of oral contraceptive use for cerebrovascular disease and 9 years for myocardial infarction. In addition, a prospective study suggested the persistence of risk for subarachnoid hemorrhage. **Estimate of Excess Mortality from Circulatory Diseases:** A large prospective study carried out in the U.K. estimated the mortality rate per 100,000 women per year from diseases of the circulatory system for users and nonusers of OCs according to age, smoking habits, and duration of use. The overall excess death rate annually from circulatory diseases for OC users was estimated to be 20 per 100,000 (ages 15 to 34 – 5/100,000; ages 35 to 44 – 33/100,000; ages 45 to 49 – 140/100,000), the risk being concentrated in older women, in those with a long duration of use, and in cigarette smokers. It was not possible, however, to examine the interrelationships of age, smoking, and duration of use, nor to compare the effects of continuous versus intermittent use. Although the study showed a 10-fold increase in death due to circulatory diseases in users for 5 or more years, all of these deaths occurred in women 35 or older. Until larger numbers of women under 35 with continuous use for 5 or more years are available, it is not possible to assess the magnitude of the relative risk for this younger age group. The available data from a variety of sources have been analyzed to estimate the risk of death associated with various methods of contraception. The estimates of risk of death for each method include the combined risk of the contraceptive method (eg, thromboembolic and thrombotic disease in the case of oral contraceptives) plus the risk attributable to pregnancy or abortion in the event of method failure. This latter risk varies with the effectiveness of the contraceptive method. The study concluded that the mortality associated with all methods of birth control is low and below that associated with childbirth, with the exception of OCs in women over 40 who smoke. (The rates given for pill only/smokers for each age group are for smokers as a class. For "heavy" smokers [more than 15 cigarettes a day] the rates given would be about double; for "light" smokers [less than 15 cigarettes a day] about 50 percent.) The lowest mortality is associated with the condom or diaphragm backed up by early abortion. The risk of thromboembolic and thrombotic disease associated with OCs increases with age after approximately age 30 and, for myocardial infarction, is further increased by hypertension, hypercholesterolemia, obesity, diabetes, or history of preeclamptic toxemia and especially by cigarette smoking. The physician and the patient should be alert to the earliest manifestations of thromboembolic and thrombotic disorders (eg, thrombophlebitis, pulmonary embolism, cerebrovascular insufficiency, coronary occlusion, retinal thrombosis, and mesenteric thrombosis). Should any of these occur or be suspected, the drug should be discontinued immediately. A four- to six-fold increased risk of postsurgery thromboembolic complications has been reported in OC users. If feasible, OCs should be discontinued at least 4 weeks before surgery of a type associated with an increased risk of thromboembolism or prolonged immobilization. 2. *Ocular Lesions.* There have been reports of neuro-ocular lesions, such as optic neuritis or retinal thrombosis, associated with the use of OCs. Discontinue OC medication if there is unexplained, sudden or gradual, partial or complete loss of vision; onset of proptosis or diplopia; papilledema; or retinal vascular lesions, and institute appropriate diagnostic and therapeutic measures. 3. *Carcinoma.* Long-term continuous administration of either natural or synthetic estrogen in certain animal species increases the frequency of carcinoma of the breast, cervix, vagina, and liver. Certain synthetic progestogens, none currently contained in OCs, have been noted to increase the incidence of mammary nodules, benign and malignant, in dogs. In humans, three case control studies have reported an increased risk of endometrial carcinoma associated with the prolonged use of exogenous estrogen in postmenopausal women. One publication reported on the first 21 cases submitted by physicians to a registry of cases of adenocarcinoma of the endometrium in women under 40 on OCs. Of the cases found in women without predisposing risk factors for adenocarcinoma of the endometrium (eg, irregular bleeding at the time OCs were first given, polycystic ovaries), nearly all occurred in women who had used a sequential OC. These products are no longer marketed. No evidence has been reported suggesting an increased risk of endometrial cancer in users of conventional-combination or progestogen-only OCs. Several studies have found no increase in breast cancer in women taking OCs or estrogens. One study, however, while also noting no overall increased risk of breast cancer in women treated with OCs, found an excess risk in the subgroups of OC users with documented benign breast disease. A reduced occurrence of benign breast tumors in users of OCs has been well-documented. In summary, there is at present no confirmed evidence from human studies of an increased risk of cancer associated with OCs. Close clinical surveillance of all women taking OCs is, nevertheless, essential. In all cases of undiagnosed persistent or recurrent abnormal vaginal bleeding, appropriate diagnostic measures should be taken to rule out malignancy. Women with a strong family history of breast cancer or who have breast nodules, fibrocystic disease, or abnormal mammograms should be monitored with particular care if they elect to use OCs instead of other methods of contraception. 4. *Hepatic Tumors.* Benign hepatic adenomas have been found to be associated with the use of OCs. One study showed that OC formulations with high hormonal potency were associated with a higher risk than lower potency formulations. Although benign, hepatic adenomas may rupture and may cause death through intra-abdominal hemorrhage. This has been reported in short-term as well as long-term users of OCs. Two studies relate risk with duration of use of the contraceptive, the risk being much greater after 4 or more years of OC use. While hepatic adenoma is a rare lesion, it should be considered in women presenting abdominal pain and tenderness, abdominal mass or shock. A few cases of hepatocellular carcinoma have been reported in women taking oral contraceptives. The relationship of these drugs to this type of malignancy is not known at this time. 5. *Use in or Immediately Preceding Pregnancy, Birth Defects in Offspring, and Malignancy in Female Offspring.* The use of female sex hormones – both estrogenic and progestational agents – during early pregnancy may seriously damage the offspring. It has been shown that females exposed *in utero* to diethylstilbestrol, a nonsteroidal estrogen, have an increased risk of developing in later life a form of vaginal or cervical cancer that is ordinarily extremely rare. This risk has been estimated to be of the order of 1 in 1,000 exposures or less. Although there is no evidence at the present time that OCs further enhance the risk of developing this type of malignancy, such patients should be monitored with particular care if they elect to use OCs instead of other methods of contraception. Furthermore, a high percentage of such exposed women (from 30% to 90%) have been found to have epithelial changes of the vagina and cervix. Although these changes are histologically benign, it is not known whether this condition is a precursor of vaginal malignancy. Male children so exposed may develop abnormalities of the urogenital tract. Although similar data are not available with the use of other estrogens, it cannot be presumed that they would not induce similar changes. An increased risk of congenital anomalies, including heart defects and limb defects, has been reported with the use of sex hormones, including OCs, in pregnancy. One case control study has estimated a 4.7-fold increase in risk of limb-reduction defects in infants exposed *in utero* to sex hormones (OCs, hormonal withdrawal tests for pregnancy or attempted treatment for threatened abortion). Some of these exposures were very short and involved only a few days of treatment. The data suggest that the risk of limb-reduction defects in exposed fetuses is somewhat less than 1 in 1,000 live births. In the past, female sex hormones have been used during pregnancy in an attempt to treat threatened or habitual abortion. There is considerable evidence that estrogens are ineffective for these indications, and there is no evidence from well-controlled studies that progestogens are effective for these uses. There is some evidence that triploidy and possibly other types of polyploidy are increased among abortuses from women who become pregnant soon after ceasing OCs. Embryos with these anomalies are virtually always aborted spontaneously. Whether there is an overall increase in spontaneous abortion of pregnancies conceived soon after stopping OCs is unknown. It is recommended that for any patient who has missed two consecutive periods, pregnancy should be ruled out before continuing the contraceptive regimen. If the patient has not adhered to the prescribed schedule, the possibility of pregnancy should be considered at the time of the first missed period, and further use of OCs should be withheld until pregnancy has been ruled out. If pregnancy is confirmed, the patient should be apprised of the potential risks to the fetus and the advisability of continuation of the pregnancy should be discussed in the light of these risks. It is also recommended that women who discontinue oral contraceptives with the intent of becoming pregnant use an alternate form of contraception for a period of time before attempting to conceive. Many clinicians recommend 3 months although no precise information is available on which to base this recommendation. The administration of progestogen-only or progestogen-estrogen combinations to induce withdrawal bleeding should not be used as a test of pregnancy. 6. *Gallbladder Disease.* Studies report an increased risk of surgically confirmed gallbladder disease in users of OCs and estrogens. In one study, an increased risk appeared after 2 years of use and doubled after 4 or 5 years of use. In one of the other studies, an increased risk was apparent between 6 and 12 months of use. 7. *Carbohydrate and Lipid Metabolic Effects.* A decrease in glucose tolerance has been observed in a significant percentage of patients on OCs. For this reason, prediabetic and diabetic patients should be carefully observed while receiving OCs. An increase in triglycerides and total phospholipids has been observed in patients receiving OCs. The clinical significance of this finding remains to be defined. 8. *Elevated Blood Pressure.* An increase in blood pressure has been reported in patients receiving OCs. In some women, hypertension may occur within a few months of beginning OC use. In the first year of use, the prevalence of women with hypertension is low in users and may be no higher than that of a comparable group of nonusers. The prevalence in users increases, however, with longer exposure, and in the fifth year of use is two and a half to three times the reported prevalence in the first year. Age is also strongly correlated with the development of hypertension in OC users. Women who previously have had hypertension during pregnancy may be more likely to develop elevation of blood pressure when given OCs. Hypertension that develops as a result of taking OCs usually returns to normal after discontinuing the drug. 9. *Headache.* The onset or exacerbation of migraine or development of headache of a new pattern which is recurrent, persistent, or severe, requires discontinuation of OCs and evaluation of the cause. 10. *Bleeding Irregularities.* Breakthrough bleeding, spotting and amenorrhea are frequent reasons for patients discontinuing OCs. In breakthrough bleeding, as in all cases of irregular bleeding from the vagina, nonfunctional causes should be borne in mind. In undiagnosed persistent or recurrent abnormal bleeding from the vagina, adequate diagnostic measures are indicated to rule out pregnancy or malignancy. If pathology has been excluded, time or a change to another formulation may solve the problem. Changing to an OC with a higher estrogen content, while potentially useful in minimizing menstrual irregularity, should be done only if necessary since this may increase the risk of thromboembolic disease. Women with a past history of oligomenorrhea or secondary amenorrhea or young women without regular cycles may have a tendency to remain anovulatory or to become amenorrheic after discontinuation of OCs. Women with these preexisting problems should be advised of this possibility and encouraged to use other contraceptive methods. Post-use anovulation, possibly prolonged, may also occur in women without previous irregularities. 11. *Ectopic Pregnancy.* Ectopic as well as intrauterine pregnancy may occur in contraceptive failures. However, in progestogen-only OC failures, the ratio of ectopic to intrauterine pregnancies is higher than in women who are not receiving OCs, since the drugs are more effective in preventing intrauterine than ectopic pregnancies. 12. *Breast-Feeding.* OCs given in the postpartum period may interfere with lactation. There may be a decrease in the quantity and quality of the breast milk. Furthermore, a small fraction of the hormonal agents in OCs has been identified in the milk of mothers receiving these drugs. The effects, if any, on the breast-fed child have not been determined. If feasible, the use of OCs should be deferred until the infant has been weaned. **PRECAUTIONS: General:** 1. A complete medical and family history should be taken prior to the initiation of OCs. The pretreatment and periodic physical examinations should include special reference to blood pressure, breasts, abdomen and pelvic organs, including Papanicolaou smear and relevant laboratory tests. As a general rule, OCs should not be prescribed for longer than 1 year without another physical examination being performed. 2. Under the influence of estrogen-progestogen preparations preexisting uterine leiomyomata may increase in size. 3. Patients with a history of psychic depression should be carefully observed and the drug discontinued if depression recurs to a serious degree. Patients becoming significantly depressed while taking OCs should stop the medication and use an alternate method of contraception in an attempt to determine whether the symptom is drug related. 4. OCs may cause some degree of fluid retention. They should be prescribed with caution, and only with careful monitoring, in patients with conditions which might be aggravated by fluid retention, such as convulsive disorders, migraine syndrome, asthma, or cardiac or renal insufficiency. 5. Patients with a past history of jaundice during pregnancy have an increased risk of recurrence of jaundice while receiving OC therapy. If jaundice develops in any patient receiving such drugs, the medication should be discontinued. 6. Steroid hormones may be poorly metabolized in patients with impaired liver function and should be administered with caution in such patients. 7. OC users may have disturbances in normal tryptophan metabolism which may result in a relative pyridoxine deficiency. The clinical significance of this is yet to be determined. 8. Serum folate levels may be depressed by OC therapy. Since the pregnant woman is predisposed to the development of folate deficiency and the incidence of folate deficiency increases with increasing gestation, it is possible that if a woman becomes pregnant shortly after stopping OCs, she may have a greater chance of developing folate deficiency and complications attributed to this deficiency. 9. The pathologist should be advised of OC therapy when relevant specimens are submitted. 10. Certain endocrine and liver function tests and blood components may be affected by estrogen-containing OCs: a. Increased sulfobromophthalein retention; b. Increased prothrombin and factors VII, VIII, IX, and X; decreased antithrombin 3; increased norepinephrine-induced platelet aggregability; c. Increased thyroid binding globulin (TBG) leading to increased circulating total thyroid hormone, as measured by protein-bound iodine (PBI), T4 by column, or T4 by radioimmunoassay. Free T3 resin uptake is decreased, reflecting the elevated TBG, free T4 concentration is unaltered; d. Decreased pregnanediol excretion; e. Reduced response to metyrapone test. **INFORMATION FOR THE PATIENT:** See Patient Labeling. **DRUG INTERACTIONS:** Reduced efficacy and increased incidence of breakthrough bleeding have been associated with concomitant use of rifampin. A similar association has been suggested with barbiturates, phenylbutazone, phenytoin sodium, tetracycline, and ampicillin. **CARCINOGENESIS, PREGNANCY, NURSING MOTHERS:** See Contraindications and Warnings sections. **ADVERSE REACTIONS:** An increased risk of the following serious adverse reactions has been associated with the use of OCs (see Warnings): Thrombophlebitis; pulmonary embolism; coronary thrombosis; cerebral thrombosis; cerebral hemorrhage; hypertension; gallbladder disease; benign hepatomas; congenital anomalies. There is evidence of an association between the following conditions and the use of OCs, although additional confirmatory studies are needed: Mesenteric thrombosis; neuro-ocular lesions, eg, retinal thrombosis and optic neuritis. The following adverse reactions have been reported in patients receiving OCs and are believed to be drug related: Nausea and/or vomiting, usually the most common adverse reactions, occur in approximately 10 percent or less of patients during the first cycle. Other reactions, as a general rule, are seen much less frequently or only occasionally: Gastrointestinal symptoms (such as abdominal cramps and bloating); breakthrough bleeding; spotting; change in menstrual flow; dysmenorrhea; amenorrhea during and after treatment; temporary infertility after discontinuance of treatment; edema; chloasma or melasma which may persist; breast changes: tenderness, enlargement and secretion; change in weight (increase or decrease); change in cervical erosion and cervical secretion; possible diminution in lactation when given immediately postpartum; cholestatic jaundice; migraine; increase in size of uterine leiomyomata; rash (allergic); mental depression; reduced tolerance to carbohydrates; vaginal candidiasis; change in corneal curvature (steepening); intolerance to contact lenses. The following adverse reactions have been reported in users of OCs, and the association has been neither confirmed nor refuted: Premenstrual-like syndrome; cataracts; changes in libido; chorea; changes in appetite; cystitis-like syndrome; headache; nervousness; dizziness; hirsutism; loss of scalp hair; erythema multiforme; erythema nodosum; hemorrhagic eruption; vaginitis; porphyria; hemolytic uremic syndrome. **ACUTE OVERDOSE:** Serious ill effects have not been reported following acute ingestion of large doses of OCs by young children. Overdosage may cause nausea, and withdrawal bleeding may occur in females. **HOW SUPPLIED:** Loestrin **21** 1/20 is available in dispensers each containing 21 tablets. Each tablet contains 1 mg of norethindrone acetate and 20 mcg of ethinyl estradiol. Available in packages of five dispensers. Loestrin **Fe** 1/20 is available in dispensers each containing 21 white tablets and 7 brown tablets. Each white tablet contains 1 mg of norethindrone acetate and 20 mcg of ethinyl estradiol. Each brown tablet contains 75 mg ferrous fumarate. Available in packages of five dispensers. Loestrin **21** 1.5/30 is available in dispensers each containing 21 tablets. Each tablet contains 1.5 mg of norethindrone acetate and 30 mcg of ethinyl estradiol. Available in packages of five dispensers. Loestrin **Fe** 1.5/30 is available in dispensers each containing 21 green tablets and 7 brown tablets. Each green tablet contains 1.5 mg of norethindrone acetate and 30 mcg of ethinyl estradiol. Each brown tablet contains 75 mg ferrous fumarate. Available in packages of five dispensers.

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UPDATE

Canada's Abortion Law Stalled

On May 29, Canada's House of Commons voted 140–131 in favor of a bill making abortion a crime unless a pregnancy threatens a woman's life or her "physical, mental or psychological health."[1] Criminal abortion legislation has been nonexistent since 1988, when the Canadian Supreme Court struck down an earlier law requiring a woman who wanted an abortion to obtain the approval of a three-person hospital committee. The bill now awaits the approval of the Senate. In the past, such approval has usually been given routinely, but just before the summer recess, the Senate designated a committee to hold hearings on the bill this fall, so its fate remains unclear.[2] The legislation has been criticized not only by abortion foes (who object to any legalization of abortion) but also by abortion providers and the Canadian Medical Association, both because it does not define physical, mental or psychological health and because it reinstates criminal sanctions for non–health-related abortions. The latter groups argue that under the law, abortion providers could be harassed by third parties bringing charges alleging that non–health-related abortions had been performed.

[1] T. Jones, "Abortion Bill Faces Vote, Canadians' Disdain," *Detroit Free Press*, May 29, 1990; and "Canada House of Commons Passes Abortion Legislation," *Wall Street Journal*, May 30, 1990.

[2] J. Holmes, Canadian Abortion Rights Action League, personal communication, July 12, 1990.

Condom Sales Climbing

Drugstore sales of condoms rose by 25 percent between 1986 and 1988, according to data from bimonthly sales audits conducted by a market research firm.[1] In 1988, approximately 299 million condoms were sold at U.S. drugstores, up from the 240 million sold in 1986. Sales of latex condoms with spermicide more than doubled over the same period, from 23 million to 50 million, while sales of latex condoms without spermicide rose from 203 million to 233 million. Although sales of natural membrane condoms rose by eight percent over the two-year period (from 14 million to 16 million), sales actually fell by 10 percent between 1987 and 1988. The researchers point out that the overall increase in condom sales corresponds to the increased publicity about and media attention to condoms owing to the AIDS epidemic and the Surgeon General's report on AIDS.

[1] J. S. Moran et al., "Increase in Condom Sales Following AIDS Education and Publicity, United States," *American Journal of Public Health*, **80**:607, 1990.

Some HIV-Test Rules Are Ignored

Hospital patients being tested for infection with the human immunodeficiency virus (HIV) are not always counseled appropriately, asked for their informed consent or even told the outcome of their test.[1] The results of a survey of 561 employees at nongovernment hospitals in the United States reveal that some U.S. hospitals are not following HIV testing and counseling guidelines established in 1987 by the Centers for Disease Control. Officials at two out of five hospitals reported that patients are never or rarely counseled before being tested for HIV infection, and respondents at one in seven hospitals said that patients are not routinely asked for their informed consent before testing. More serious, personnel at 22 hospitals reported that patients who test positive are not always told the results of their test. All of these practices could leave a hospital open to legal action (if, for example, a former patient were to unknowingly infect another person after having been tested for HIV at the hospital).

[1] "Hospital HIV-Testing Programs Not Protecting Patients," *AIDS Alert*, **5**:81, 1990.

Pregnancy Halts Smoking—Briefly

Almost two in five white women who smoke cigarettes stop smoking during pregnancy, the vast majority around the time they discover that they are pregnant. However, according to 1986 data from a national telephone survey,[1] 71 percent of those who stop during pregnancy resume smoking within one year of their baby's birth, 27 percent before a month has elapsed. Respondents who did not graduate from high school are much less likely than college graduates to stop smoking during pregnancy (28 percent vs. 60 percent), and women who smoke one or more packs of cigarettes per day are less likely to quit during pregnancy than are those who smoke less (25 percent vs. 59 percent). Nearly all of those who quit say they did so on their own, without the aid of a special program or counseling.

[1] L. A. Fingerhut, J. C. Kleinman and J. S. Kendrick, "Smoking Before, During and After Pregnancy," *American Journal of Public Health*, **80**:541, 1990.

Abortion Deaths Due to Embolism

Between 1972 and 1985, 45 women died as a result of a pulmonary embolism during or after a legal abortion (usually because of the leakage of either air or amniotic fluid into the blood or by the formation of a blood clot), accounting for 21 percent of all abortion-related deaths during that time.[1] However, the proportion of all deaths from legal abortion attributable to embolisms declined from 24 percent in 1972–1978 to 15 percent in 1979–1985, and the mortality rate from embolism fell from 5.6 deaths per 1,000,000 abortions in the former period to 1.2 per 1,000,000 in the latter period. (In comparison, the rate of fatal pulmonary embolisms associated with delivery was 26 per 1,000,000 live births over the period 1970–1985.[2]) The risk of a fatal embolism was twice as great among blacks as among whites (4.6 deaths vs. 2.2 deaths per 1,000,000 abortions). Women having an abortion at 13–15 weeks of gestation were six times as likely to die of an embolism as women having an abortion at 12 or fewer weeks, and those having an abortion at 16 or more weeks were 28 times as likely to die as those having an abortion at 12 or fewer weeks. Furthermore, a hysterectomy or hysterotomy was 122 times as likely as a curettage abortion to result in fatal embolism, while an instillation abortion was about 25 times as likely as a curettage abortion to end in a fatal embolism.

1. H. W. Lawson, H. K. Atrash and A. L. Franks, "Fatal Pulmonary Embolism During Legal Induced Abortion in the United States from 1972 to 1985," *American Journal of Obstetrics and Gynecology*, **162**:986, 1990.
2. A. L. Franks et al., "Obstetrical Pulmonary Embolism Mortality, United States, 1970–85," *American Journal of Public Health*, **80**:720, 1990.

Nonsurgical Sterilization in China

A potentially reversible nonsurgical method of male sterilization has shown early success in Chinese tests so far: The method, in which a small amount of liquid polyurethane is injected into the vas deferens to form a plug, has been tried by 12,000 men, including 1,000 who have been followed for five years and 2,600 who have been followed for three years.[1] The incidence of complications (such as local infection or hematoma) has been low. Also, researchers believe that if a man wants to have more children, removal of the plastic plug will restore fertility. So far, of 86 men who have asked for removal of the plugs, 51 have subsequently impregnated their wives, including all 31 whose sterilizations had been reversed for at least one year.

1. Z. Sheng-cai, "Vas Deferens Occlusion by Percutaneous Injection of Polyurethane Elastomer Plugs: Clinical Experience and Reversibility," *Contraception*, **41**:453, 1990.

A Decade of Assisted Conception

Between 1978 and 1987, British women carried to term 1,267 pregnancies that were conceived by artificial means, either outside the body (by in vitro fertilization) or within the fallopian tubes (by gamete intrafallopian transfer); these pregnancies resulted in 1,581 live births or stillbirths.[1] According to a study examining the experience with assisted conception at nearly all of the clinics that have provided such services in Great Britain, assisted conceptions were more likely than natural conceptions to have resulted in multiple births (23 percent vs. one percent). In addition, the infants were more likely to have been born premature (24 percent vs. six percent) or underweight (32 percent vs. seven percent). However, much of this excess was attributed to the higher level of multiple births, and once that likelihood was controlled for, the rates of stillbirth and infant mortality were no greater than would have been expected. An indication of the rapid recent growth in assisted conceptions is that only 12 percent of births resulting from in vitro fertilization occurred between 1978 and 1984, while 56 percent occurred in 1986 and 1987.

1. Medical Research Council Working Party on Children Conceived by In Vitro Fertilization, "Births in Great Britain Resulting from Assisted Conception, 1978–87," *British Journal of Medicine*, **300**:1229, 1990.

Chlamydia: Who Should Be Tested?

About six percent of a group of 1,320 sexually active college women tested positive for chlamydia during the course of routine immunoassay screening, but young women with symptoms of infection or gynecologic problems were not much more likely to be infected (seven percent) than those making a routine visit to the clinic (five percent).[1] Patients who were 22 or younger, who had a relatively new sexual partner, who were bleeding from the cervix, who had a positive test for bacterial vaginosis or who could be diagnosed by pelvic examination as possibly having chlamydia were all significantly more likely to have tested positive. However, these factors in themselves were not necessarily effective as a screening tool for detecting young women at high risk for chlamydia. For example, if women with only these risk factors had been tested, the number of immunoassays conducted would have been halved, but 14 of the 75 women found infected with chlamydia would not have been detected. The researchers conclude that "signs, symptoms, history and demographic variables . . . are insufficient to predict infection accurately."

1. C. K. Malotte, E. Wiesmeier and K. J. Gelineau, "Screening for Chlamydial Cervicitis in a Sexually Active University Population," *American Journal of Public Health*, **80**:469, 1990.

RU 486 Softens the Cervix

The antiprogestin mifepristone (known widely as RU 486) decreases cervical resistance to dilatation in both pregnant and nonpregnant women, according to a recently reported pair of double-blind studies.[1] In one study, 15 of 30 pregnant women undergoing first-trimester abortions were given mifepristone 48 hours before surgery, while the other 15 were given a placebo. A similar study design was used with a group of 30 nonpregnant women about to have a diagnostic curettage or a tubal sterilization. In both cases, the women who had been given mifepristone had a greater degree of cervical dilatation before the procedure than did those who had been given the placebo; likewise, less force was needed to further dilate the cervix among the women treated with mifepristone than among those who were not. Overall, only 28 percent of the women treated with mifepristone required further cervical dilatation, compared with 80 percent of the untreated women. The investigators note that the biological reason for this effect is unclear and requires further study, but that mifepristone may prove helpful not just in first-trimester abortions but in procedures such as IUD insertion and removal, endometrial sampling, laser treatment of cervical lesions and diagnostic curettage.

1. J. K. Gupta and N. Johnson, "Effect of Mifepristone on Dilatation of the Pregnant and Nonpregnant Cervix," *Lancet*, **I**:1238, 1990.

Health Coverage and Prenatal Care

Health insurance coverage was the single most important factor in the quality of prenatal care obtained by a group of 202 poor, primarily black women in Detroit; alone, this variable accounted for half of the variance in the adequacy of the women's prenatal care.[1] Five other factors—the women's initial attitude toward the pregnancy, their perception of the importance of prenatal care, how long they waited to tell someone else that they were pregnant, their attitude toward health professionals and how soon they suspected they were pregnant—were also significant predictors. Factors directly related to the baby's birth weight were how soon the woman recognized she was pregnant, the quality of prenatal care and history of substance abuse and hypertension. The investigators advocate easing the registration process for Medicaid: Most of the women with no insurance coverage knew they were eligible for Medicaid but had had discouraging experiences with social workers or with the registration process. In addition, the researchers suggest that "more vigorous, culturally appropriate education programs" might help promote prenatal care among those who do not understand why it is important.

1. M. L. Poland et al., "Quality of Prenatal Care; Selected Social, Behavioral and Biomedical Factors; and Birth Weight," *Obstetrics & Gynecology*, **75**:607, 1990.

Low-Income Women's Perceptions Of Family Planning Service Alternatives

By Lawrence J. Severy and Kevin McKillop

Low-income family planning clients thought it important that staff members at family planning clinics be trustworthy, friendly, understanding and not bossy—characteristics about as important to them, in fact, as training and competence.

Summary

A sample of 665 low-income women from a predominantly rural area of north central Florida rated the value of 25 features of family planning providers and reported their perceptions of how characteristic each feature was of different types of providers. A well-trained, trustworthy and friendly staff, the presence of a doctor if you need one and a staff that is gentle with the examination were the most desirable features of family planning services. The respondents' perceptions of public health clinics suggest that the strongest qualities of such facilities are that they treat people from different backgrounds, accept Medicaid, are easy to find and teach you how to avoid pregnancy and how to take care of yourself and stay healthy. Features thought most characteristic of private physician services were a well-trained staff, privacy and the presence of a doctor if you need one. Voluntary organizations were seen as providing services for people of different backgrounds, having a friendly staff, serving as a referral agency and teaching about staying healthy and avoiding pregnancy. However, voluntary organizations were rated lower than public health clinics or private physicians on nearly all features.

The total scores for public health clinics and private physicians were not significantly different from each other, but both were noticeably higher than the score for voluntary organizations. Ethnicity affected ratings dramatically, with black respondents clearly more favorable toward public health clinics and private physicians than white respondents; conversely, whites were more positive toward voluntary organizations than were blacks. For many of these low-income respondents, the high ratings of private physicians may have represented their expectations rather than their actual experience.

Introduction

Each year, millions of U.S. women seek family planning services, and the delivery of these services has been carefully documented over time.[1] A 1988 review that compared women who seek services from private physicians with those who attend clinics concluded that "among women who are able to choose their providers, private physicians are the usual source of care. Low-income women who visit clinics do so primarily because they cannot afford private physicians' fees or because private physicians will not accept Medicaid reimbursement, whereas clinics will."[2] In a similar vein, a number of studies have attempted to describe the factors that affect how women choose their source of family planning care;[3] one set of researchers acknowledges that such investigations are based upon data that "do not include direct questions on the reasons why women chose their provider."[4] Therefore, prior work can be viewed more as analyses of use patterns than as studies of the choice process or of the reasons for choice.

More than 40 million visits for family planning services are made each year in the United States.[5] Approximately one-third are made to one of 5,100 publicly funded family planning clinics,[6] with the remaining two-thirds handled by the 68,000 obstetrician-gynecologists and by general and family practitioners who provide reversible contraceptive services.[7]

Research suggests that because of the high cost of health services and the small proportion of physicians who offer flexible fees, many low-income family planning patients "are effectively shut out of the private sector."[8] Further, because many physicians do not accept Medicaid reimbursements or reduce their fees, the access of low-income patients to private reproductive health care is limited.[9] Therefore, among both black and white women, income and source of payment profoundly affect the use of providers.[10]

Because low-income women have problems in obtaining contraceptive services from private physicians, the federal government enacted legislation to improve their access to those services. Two assumptions guided that legislation, according to one observer. First, it was assumed that "more or better family planning clinics in the community would lead more women, especially poor women, to begin to use family planning services. It was not intended or believed that clinics would simply replace private physician services.... Secondly, it was assumed that when women began to use family planning services, whether from a clinic or a private physician, they would be more successful in preventing unwanted or untimely pregnancies than they had been previously."[11] The investigator concluded that both of these assumptions have been confirmed with the passage of time. Unfortunately, utilization of family planning services remains less than ideal, and reasons for individual choices are still unclear.

One way to explain differences in health-related behavior (for example, seeking prenatal care) is to investigate use rates among various subgroups, but this approach offers no explanation of why such

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differences exist.[12] An important distinction must be made between who uses a particular form of health service and why that user might have chosen one provider over another. Despite public family planning clinics' clear impact on the birthrate, and despite their important role in providing many women with services, there exists no body of studies that focuses on such topics as the choice of a provider or visit rates for family planning services.[13] The reasons why low-income women in particular choose clinics over private physicians for family planning are even more overlooked, and it is this subgroup on which our research concentrates.

There are a few areas of research upon which an adequate foundation for investigation can be built: adolescents' reasons for utilizing family planning services, decision-making about fertility and fertility regulation, and approaches to understanding the acceptability of social programs. Research in the first of these areas has found the two most important reasons given by teenagers for visiting a clinic rather than a private physician for family planning information are the expense of visiting a private physician and the teenagers' concern that a physician would tell their parents about the visit; also important was that many teenagers did not know of a doctor to whom they could go.[14] When teenage patients from clinics in a number of cities were asked to describe the most important reason for choosing a particular clinic over any other source of family planning assistance, the five most important reasons were confidentiality (that is, the clinic did not inform their parents), the belief that the staff "cares about" teenagers, a private and convenient location, use of the clinic by friends and the fact that it was the only clinic that the patients knew about.[15]

A great deal of research suggests that the best predictor of patients' compliance with a medical regimen and the best predictor of follow-up visits (and, in essence, the best predictor of a good prognosis) is that the patient considers the physician-patient relationship to be a high-quality one.[16] A slight variation on this theme has been reported elsewhere: When the staff of family planning clinics was more directive (requiring clients to follow rules and urging them to use effective methods), teenage women's subsequent contraceptive use was more effective.[17] It may be that the young women responded to clinic personnel who appeared to demonstrate that they cared. Clearly, though, these studies have limitations: They are not based on national samples, and they include only teenagers. Since subjects were contacted at clinics, women seeking or using other forms of family planning services were excluded. Finally, these samples were not restricted to low-income women.

In the second line of research, on decision-making in the area of fertility and fertility-regulating behavior, the last 10 years have seen the fruitful use of expectancy-value theorizing.[18] A number of these studies have addressed the decision of whether to have another child or to practice contraception;[19] others have investigated abortion decision-making,[20] breastfeeding decision-making[21] and the choice of a contraceptive method.[22] In all of those studies, respondents described their perceptions (hence, expectancy) of the alternatives and weighted these perceptions by their own beliefs about the importance (hence, value) of the characteristics of these alternatives. Beyond demonstrating the successful predictive power of expectancy-value models, these approaches aid in identifying the reasons for choice. Which features are most valued in a contraceptive? Do people perceive the various features of such methods as the pill, condom and IUD accurately?

A third line of research is the assessment of the acceptability of social programs. A survey of 535 patients at 12 federally funded clinics for poor, inner-city residents in the Detroit area identified 24 criteria for acceptability, but factor analysis reduced these to five: doctor's care, nurse's care, waiting time, accessibility and comfort. Only the first two were correlated with the patients' satisfaction, which in turn was related to the likelihood of revisiting a clinic.[23] Unfortunately, this study failed to consider the possibility that perception of program features lacks explanatory power if the patient is not asked if the perceived features are important.

The study of low-income women's choice of family planning service delivery described in this article is guided by the straightforward assumption that choice is determined by two principles. First, women have different perceptions (accurate or inaccurate) of the characteristics of alternative sources of family planning services; second, their perceptions of certain program features as attractive or unattractive vary as well. We analyze the reasons behind women's choice of providers by examining low-income women's perceptions of the features of various types of family planning providers with their individual ideas about the value of these features. The study is intended to examine both who chooses different family planning service delivery systems and why they make these choices; the study also examines the most important features and the "reasons" (the values or perceptions) that will most likely lead to the choice of one form of family planning service delivery over another.

Methodology

Our approach to understanding the choice of a family planning provider required the identification of program characteristics. To ensure that the list of characteristics included in the study was both appropriate and comprehensive, focus group interviews were conducted with people from all layers of the family planning delivery system, including low-income women, physicians, state agency personnel, clinic providers, health care workers and social workers. In addition, we reviewed the family planning literature for features essential to program acceptance. An initial list of 61 characteristics derived from both sources was submitted to a pilot sample, and a factor analysis reduced these responses to a final list of 25 program features. Some of these features related to women's receptiveness to social programs in general, while others dealt specifically with family planning services.

On the expectancy-value questionnaire, the study participants were first asked to rate the value of each feature. (For example: "Would you like or dislike a place where you can trust the staff?") Each item was rated on a seven-point, bipolar scale ranging from "like very much" to "dislike very much." The respondents' perceptions of each feature as it applies to three service models (private physicians, publich health clinics and voluntary organizations) were then assessed. (For example: "Do you think that at public health clinics you can trust the staff?") Each of these items was rated on a seven-point scale ranging from "definitely yes" to "definitely no." We also assessed respondents' demographic information, including geographic and transportation factors, age, ethnicity, pregnancy and health history, family characteristics and income level.

Three types of service delivery programs operate in the geographic area included in this study. First, there are family planning services provided by private physicians. A second group consists of providers that are largely funded by local, state and federal governmental agencies; in different locales, these may be known as public health clinics, hospital clinics or community health centers. The third type, the voluntary organization, tends to receive less di-

Table 1. Respondents' mean value rating (in rank order) of various features of family planning services

Feature	Mean rating
Would you like or dislike a place . . .	
Where the staff is well trained	2.82
Where you can trust the staff	2.71
Where the staff is friendly	2.66
That has a doctor there if you need one	2.66
Where the staff is gentle with examinations	2.65
That is easy to find	2.63
Where they teach you how to take care of yourself and stay healthy	2.59
That does not cost much	2.55
Where you are not embarrassed to talk to the staff	2.54
Where you have a lot of privacy	2.53
Where they understand you as a person	2.53
Where they take time to get to know you	2.43
That tells you about other places that can help you with family problems	2.43
Where they tell you what to expect before they examine you	2.13
Where they teach you ways not to become pregnant	2.10
Where the staff remembers who you are each time you go	2.09
That has social workers/counselors	1.97
That takes Medicaid	1.70
Where people from all different backgrounds go	1.40
Where friends tell you to go	1.06
That cannot take care of all your health problems	–1.45
Where there is a long waiting time	–1.84
Where the waiting room is not nice/not comfortable	–2.11
Where some of the staff bosses you around	–2.27
Where they have staff members who do not care about your health	–2.50

rect governmental support; it is often staffed by volunteers or exists as a result of the charity of others. (Often structured as women's health facilities, and typical of local Planned Parenthood operations, voluntary organizations are clearly much less formal and bureaucratic than are public health clinics.)

Quota sampling procedures were used to assemble the sample. One of our goals was to sample equivalently from three age-groups: 18–24, 25–34 and 35–44. Another goal was to sample women seeking services from different types of providers; however, despite contacting every physician in the sample area likely to provide family planning services, we could find only seven women who volunteered to participate and were seeking services from private physicians. Consequently, the final sample of 665 low-income women represented women seeking family planning services predominantly from public health clinics or voluntary organizations. These women were from Administrative District Three of the State of Florida Health and Rehabilitation Services, which comprises approximately 10,000 square miles in north central Florida and is mostly rural, with only two small cities. The 12-county area has a very low per-capita income and includes the county with the lowest per capita income in the state.

The original contacts between the study sample and the survey team took place in 1984 at 30 clinics; of these, 23 were public health clinics and seven were operated by voluntary organizations such as Planned Parenthood. Data were collected from among low-income women who completed a self-administered questionnaire. (If a respondent had reading problems, a research assistant read each question and recorded the respondent's answers.) Completion of the questionnaire usually took 15–20 minutes. Choice of clinic, interview site, time and day were determined randomly during the study period. All low-income women seeking family planning services on these randomly selected days were invited to participate. All respondents were given $5 honoraria for their cooperation. Virtually all of the potential respondents agreed to participate.

More than 80 percent of the sample had an income at or below poverty level, and the remaining 20 percent fell between 101 percent and 150 percent of poverty; the latter group was virtually no different from those below poverty level with regard to the attitudinal portions of the questionnaire, so the two subsamples are not differentiated in the following analyses.

Although the black population is a minority in the geographic area used for this study, it is overrepresented in the income levels being studied, and black women seem more likely than white women to use public health clinics for family planning.[24] Therefore, we had expected to generate a sample containing almost equal numbers of black women and white women. However, only 41 percent of the final sample was black, and this proportion varied substantially by recruitment site, with the proportion of black respondents being 45 percent at public health clinics and 19 percent at voluntary organizations. Although this trend appeared to be more pronounced among the younger respondents, the overall racial distribution was fairly consistent across all three age-groups, with the black population ranging from 37 percent of 18–24-year-olds to 45 percent of 35–44-year-olds. Therefore, subsequent analyses were conducted with special attention to ethnicity's potential impact on perceptions of family planning programs.

Importance of Program Features

Respondents first were asked whether they would like or dislike a program that had each of the specific features listed in Table 1. Our aim was to use the 25 program features to create a description of the ideal family planning provider. Using a scale ranging from "like very much" (+3) to "dislike very much" (–3), we calculated the mean desirability of each characteristic. The results are shown in the table, from the most to the least valued feature.

The most desirable features of family planning service delivery programs were a well-trained staff (2.82), the trustworthiness of the staff (2.71), the friendliness of the staff (2.66), the presence of a doctor if you need one (2.66) and the staff's gentleness with the examination (2.65). The least desirable features were a staff that does not care about your health (–2.50) and that bosses you around (–2.27). These attributes seem to represent two major concerns—staff competence and the quality of interpersonal interaction.

There are a number of ways to subdivide the initial study population to assess potential differences of opinion with regard to valued program features. Utilizing a multivariate analysis of variance to avoid overvaluing any single feature, we found that women with no children were more concerned with trust, less willing to wait a long time, less interested in whether the provider serves people of many backgrounds and more accepting of "bossy staff" than were women with at least one child ($F\ [50,1170]=1.53$, $p<0.02$). As might be expected, given that Medicaid is usually provided only to women who have had a child, respondents with no children rated a clinic's willingness to take Medicaid as slightly preferable (1.04), whereas those with one child or two or more children (1.96 and 1.97, respectively) appreciated this feature more ($F\ [2,262]=44.08$, $p<0.0001$). Ethnicity also had a statistically significant impact ($F\ [25,585]=4.99$, $p<0.001$), suggesting that blacks were more interested than whites in having access to social workers and counselors (2.15 vs. 1.86), in being told what to expect before the examination (2.38 vs. 1.75) and in knowing whether or not a clinic accepts Medicaid (2.05 vs. 1.46).

Perceptions of Providers

The respondents' perceptions of the types of family planning services were determined in a manner similar to that in which the value they placed on each program feature was determined. They rated each of the 25 characteristics from "very charac-

Table 2. Respondents' mean perception rating of features of family planning services, by type of provider

Feature	Public health clinic	Private physician	Voluntary organization
Staff is well trained	1.79	2.32	1.11
You can trust the staff	1.51	1.91	1.02
Staff is friendly	1.31	1.40	1.24
There is a doctor present if you need one	0.86	2.02	0.41
Staff is gentle with examinations	1.32	1.08	1.10
Provider is easy to find	1.61	0.66	0.58
Staff teaches you how to take care of yourself and stay healthy	1.62	1.88	1.51
Provider does not cost much	0.73	–0.61	–0.14
You are not embarrassed to talk to staff	0.60	0.59	0.48
You have a lot of privacy	0.15	1.90	0.14
Staff understands you as a person	0.80	1.10	0.93
Staff takes time to get to know you	0.53	1.15	0.70
Staff tells you about other places that can help with family problems	1.43	1.10	1.56
Staff tells you what to expect before examination	0.89	1.23	0.93
Staff teaches you ways not to become pregnant	1.95	1.54	1.48
Staff remembers you each time you go	0.19	1.16	0.05
Provider has social workers/counselors	1.00	–1.15	0.78
Provider takes Medicaid	1.98	–0.14	0.61
Provider serves people from different backgrounds	2.00	1.07	1.62
Friends tell you to go to provider	0.67	0.91	0.56
Staff cannot take care of all of your health needs	0.29	–0.06	0.12
There is a long waiting time	1.39	0.38	0.75
Waiting room is not nice/not comfortable	–0.09	–0.66	–0.21
Staff bosses you around	–0.60	–0.70	–0.70
Staff does not care about your health	–0.95	–0.75	–0.76

teristic" of a particular type of provider (+3) to "not at all characteristic" (–3). Common perceptions of public health clinics, shown in the first column of Table 2, suggest that such facilities are valued because they treat people from different backgrounds, take Medicaid, teach you ways not to become pregnant and teach you how to take care of yourself and stay healthy. Respondents disagreed with the possibility that public health providers do not care about your health and boss you around.

In a multivariate analysis of variance similar to that described for the value ratings, only educational level (F [50,1176]=1.75, $p<0.002$) and ethnicity (F [25,588]=4.06, $p<0.0001$) influenced the perceived features of public health clinics. With regard to the differences in perceptions based upon one's educational level, 10 of the 25 features generated statistically significant univariate analyses of variance. In most instances, women with more than a high school education rated providers substantially differently than did those with less education. The more highly educated women were less likely to believe that the staff takes time to get to know you, that you have a lot of privacy, that you can trust the staff, that the staff remembers who you are each time you go there, that the staff is friendly, that the staff understands you as a person, that the staff teaches you how to take care of yourself and that the staff avoids bossy behavior. Finally, the more highly educated respondents believed more strongly that such facilities do not cost much.

Thirteen of the 25 features generated statistically significant results in univariate analyses of variance according to ethnicity. Several of the larger divergences of opinion suggest that blacks were more certain than whites that the staff at public health clinics would take the time to get to know you, that you have privacy at such facilities, that the staff is gentle with examinations and that the staff spends time teaching you how to take care of yourself and stay healthy; whites were more likely than blacks to believe that the staff would not remember you each time you went and that such programs do not cost much.

Ratings of the respondents' perceptions of private physicians as providers of family planning services can be found in the second column of Table 2. The features rated as most characteristic seem tautological, in that they refer to a well-trained staff and the presence of a doctor if you need one. Other high rankings suggest that family planning services from private physicians offer a staff you can trust, a lot of privacy and a source of information about how to take care of yourself and stay healthy. Rated as least characteristic was the presence of social workers or counselors; the respondents also believed private physicians to be less likely to accept Medicaid clients. It is noteworthy that most of the features perceived to be typical of private physicians are different from those deemed characteristic of public health clinics.

Women's perceptions of the services offered by private physicians varied significantly by number of children (F [50,1190]=1.75, $p<0.002$), educational level (F [50,0090]=2.14, $p<0.0001$) and ethnicity (F [25,595]=8.94, $p<0.0001$). Because the association with ethnicity was so strong, we will focus on this variable: Not only was the main effect of the multivariate analysis of variance statistically significant, but so were 16 of the 25 univariate analyses of variance. In virtually all instances, blacks viewed the features of private physicians' services more positively than did whites. For example, black respondents were more likely to believe that physicians would take the time to get to know you, offer more privacy, be friendlier, and so on.

Table 2 also presents the women's ratings of voluntary organizations, which were seen as providing services for people of different backgrounds, providing referrals and teaching about staying healthy and avoiding pregnancy; being friendly was also viewed as characteristic. The least characteristic features were those indicating that the staff is uncaring and bossy.

The results of a multivariate analysis of variance regarding beliefs about the services offered by voluntary organizations were complex. Differences in the women's perceptions varied significantly as a function of number of children (F [50,1182]=1.51, $p<0.02$) and ethnicity (F [25,5591]=5.17, $p <0.001$); in addition, several interactions—number of children and educational level (F [100,2345]=1.38, $p<0.01$), number of children and ethnicity (F [50,1182]=2.13, $p<0.0001$) and number of children and educational level by ethnicity (F [100,2345]=1.39, $p<0.01$)—were significant. An example of the way in which perceptions of voluntary organizations varied by the respondents' education is found in the ratings of the feature suggesting that staff members do not care about your health. Respondents with more

Table 3. Mean scores indicating respondents' support of various family planning providers, by type of provider favored and reasons for favoring a provider

Reasons	Public health clinic	Private physician	Voluntary organization
Favoring public health clinics			
Provider is easy to find	4.22	1.69	1.49
Provider takes Medicaid	3.67	–0.47	1.20
Provider does not cost much	2.05	–1.69	–0.37
Staff teaches you ways not to become pregnant	4.43	3.60	3.45
Provider serves people from different backgrounds	3.10	1.86	2.65
Staff is gentle with examinations	3.49	2.92	2.97
Provider has social workers/counselors	2.19	–2.23	1.80
Staff does not care about your health	2.62	2.27	–2.18
You are not embarrassed to talk to staff	1.56	1.46	1.33
Favoring private physicians			
You have a lot of privacy	0.22	4.93	0.25
Provider has a doctor there if you need one	2.25	5.47	1.01
Staff remembers you each time you go	0.56	2.59	0.26
Staff is well trained	5.02	6.62	3.11
You can trust the staff	4.11	5.26	2.88
Waiting room is not nice/not comfortable	0.35	1.76	0.65
Staff takes time to get to know you	1.32	2,91	1.91
There is a long waiting time	–3.00	–0.62	–1.60
Staff tells you what to expect before examination	2.44	3.27	2.49
Staff teaches you how to take care of yourself and stay healthy	4.31	5.02	4.00
Staff understands you as a person	2.27	2.98	2.51
Friends tell you to go to provider	1.22	1.55	1.00
Staff is friendly	3.45	3.83	3.40
Favoring voluntary organizations			
Staff cannot take care of all of your health needs	–0.24	–0.54	0.20
Staff tells you about other places that can help with family problems	3.61	2.82	3.86
Staff bosses you around	1.45	1.75	1.84

Note: Scores can range from 9.00 to –9.00.

than a high school education disagreed more strongly with the statement (–1.10) than did high school graduates (–0.73) or those who had not graduated from high school (–0.42).

The five features rated as most characteristic of private physicians generated mean scores of 1.88–2.32; the five features considered most characteristic of public health clinics had means of 1.62–2.00; and those of voluntary organizations were rated 1.24–1.62. These data suggest that respondents were less certain about the features of the various programs than they were about the features that they considered representative of an ideal program (Table 1). Further, respondents were more definite in their perceptions of private physicians than they were in their perceptions of public health clinics or voluntary organizations. In practically all instances, the absolute value of the rating for a feature of a voluntary organization was lower than was that of a public health clinic or private physician. The respondents may have been less certain about the features of voluntary organizations, and therefore less likely to either strongly agree or strongly disagree with the set of potential attributes. If so, the implications are clear: These women did not know as much as they might have about the alternatives to private physicians, particularly voluntary organizations.

Among the five items rated as most characteristic of each of the three types of providers, a number appeared in common. In all three cases, women said that the provider would teach you how to take care of yourself and stay healthy; public health clinics and voluntary organizations also shared the defining feature that the provider serves people from a variety of backgrounds and that the staff teaches you how to avoid pregnancy. Private physicians and public health clinics were both cited as having well-trained staff. These descriptions point to a positive picture of the available alternatives.

However, some features differentiate the programs. A public health clinic was perceived as "a place that takes Medicaid," while a private physician was seen as a type of provider where there is "a doctor . . . if you need one" and where "you have a lot of privacy." Voluntary organizations were rated as places where "they tell you about other places that can help you with family problems" and where "staff is friendly." All of these descriptions seem appropriate and provide confidence in the quality of the entire data set.

A factor analysis was conducted to summarize the perceptions of these features. We performed a principal components extraction and an orthogonal rotation (meant to reveal underlying dimensions that are mathematically uncorrelated) and found that four factors accounted for 47 percent of the original rank of the data matrix. This somewhat low rate was expected, as the 25 features were generated by procedures designed to identify unique contributory factors. The first factor, labelled clinic competence, included these defining attributes—staff is well trained, provider offers privacy, provider has a doctor if you need one, staff can be trusted and staff remembers who you are; this factor accounted for 39 percent of the explained variance. A second factor, labelled friendly staff, included these defining features—staff understands you as a person, staff is friendly, staff does not boss you around, staff does not make you wait and staff is gentle with examinations; these factors represented 26 percent of the explained variance. The third factor, called stereotypic social agency, includes these defining characteristics—provider takes Medicaid clients, provider serves people from all different backgrounds, provider has social workers and provider is easy to find; this factor represented 20 percent of the explained variance. The fourth factor, labelled minimalistic (a dimension most likely reflecting inexpensive, low-quality care), includes these defining features—waiting room is not nice, staff does not care about your health problems, provider does not cost much and provider cannot take care of your health problems; this factor represented 15 percent of the explained variance.

Respondents had vastly discrepant perceptions of the three types of family planning programs when the programs were rated according to these four factors. Private physicians were perceived as offering extremely competent services but having the least friendly staff; voluntary organizations, conversely, were perceived as having a very friendly staff but offering the least competent services. Public health clinics were viewed as located between these two extremes; on the other hand, they were rated the highest on being like a social agency, with private physicians scoring the lowest in this regard. Although the difference was not as dramatic, public health clinics were considered the most minimalistic and private physicians the least so. Voluntary organizations claimed the middle ground on both factors.

Combining Value and Perceptions

We have described the features of family planning programs that low-income women would find desirable, as well as the women's perceptions of existing program alternatives. Next, we will weight the program perceptions by the respondents' ratings of whether or not various features are valued in their choice of a program. The combination of valued and perceived features of family planning service alternatives may be viewed as the "reasons" for women's choice of one delivery approach over another.

For each of the features analyzed, we multiplied the value rating by the perception rating; Table 3 presents the 25 results for each of the three program approaches. (Potential scores range from –9 to 9.) The means for public health clinics clearly show that the greatest reason for the choice of public health clinics for family planning services is the belief that the staff is well trained (a mean score of 5.02). Important support is also generated by features such as teaching ways not to become pregnant (4.43), teaching how to take care of yourself and stay healthy (4.31), being easy to find (4.22) and having a trustworthy staff (4.11). On the other hand, women did not like a long waiting time, and generally believed that public health clinics require such waits. Further, women did not like a program that cannot take care of all of their health problems, which is also a widely perceived problem of public health clinics providing family planning services.

Besides showing the absolute magnitude of support on each feature for each type of provider, Table 3 also indicates the relative advantage one type of provider has over the others for each feature. For example, according to the respondents' ratings, the greatest advantage that public health clinics have over private physicians and voluntary organizations is that they are easy to find (4.22 vs. 1.69 and 1.49). In contrast, there is very little advantage for public health clinics over the other types of providers in the respondents' degree of embarrassment in talking to the staff (1.56 vs. 1.46 and 1.33).

A multivariate analysis of variance of the means indicated that number of children (F [50,1134]=1.43, p<0.03), educational level (F [50,1134]=2.11, p <0.001) and ethnicity (F [25,567]=3.76, p <0.001) all significantly influenced the scores for public health clinics. For example, for the vast majority of features, blacks expressed more support for public health clinics as providers of family planning services than did whites.

Table 3 also presents the reasons for acceptance or rejection of services from private physicians. The feature generating the greatest support was that the staff is well trained (6.62). Also statistically significant were that the provider has a doctor there if you want one (5.47), that you can trust the staff (5.26) and that the staff teaches you to take care of yourself and stay healthy (5.02). In fact, for 13 of the 25 features in Table 3, private physicians were found to be more attractive than the other providers. The least attractive features of physician services were that social workers or counselors are not available (–2.23), that physician services are costly (–1.69), that there is a somewhat long waiting time (–0.62) and that physicians are not likely to accept Medicaid (–0.47). Privacy represented the greatest advantage of physicians (4.93) over the other providers (0.22 and 0.25), according to the respondents, while the smallest difference involved the friendliness of the staff (3.83 vs. 3.54 and 3.40).

Multivariate analyses of variance using the scores for physicians as dependent variables revealed that number of children (F [50,1138]=1.57, p<0.01), educational level (F [50,1138]=2.29, p<0.0001) and ethnicity (F [25,569]=7.25, p<0.0001) had statistically significant effects. The results suggest that black respondents were much more positive about private physicians than were whites, that women with less than two children were more positive about physicians than were those with larger families and that more educated women generally were more positive about private physicians as providers of family planning services.

Given that there seemed to be some lack of certainty regarding the features of family planning services provided by voluntary organizations, it is not surprising that the scores for such organizations were lower than for the other two types of services. The most attractive feature was the belief that voluntary organizations teach you how to take care of yourself and stay healthy (4.00). Women also liked the referral capabilities of voluntary organizations (3.86), and the score for this feature was higher than the scores generated by public health clinics (3.61) or physicians (2.82). Voluntary organizations also received the best score for not bossing people around (1.84), and for having a staff capable of taking care of the clients' health needs. For all other features, at least one of the other two types of services scored higher than voluntary organizations. Furthermore, the advantage of voluntary organizations over the other providers was relatively small. For example, the staff at voluntary organizations was slightly more likely to be able to take care of the client's health needs (0.20) than the other providers (–0.24 and –0.54).

Number of children (F [50,1134]=1.44, p<0.03), educational level (F [50,1134]= 1.67, p<0.003) and ethnicity (F [25,567]= 4.33, p<0.0001) were again significant in a multivariate analysis of variance: Woman with no children were more likely than those with children to rate voluntary organization services highly; more highly educated respondents were more likely than the less educated to rate such providers favorably; and whites were more likely than blacks to favor these providers.

In summary, an important influence on the acceptability of different types of providers was ethnicity, with blacks more supportive of private physicians and public health clinics and whites more supportive of voluntary organizations. In general, voluntary organizations were considered best at serving as a referral agency, public health clinics were considered best at being affordable and easy to find, at serving many different people and at teaching clients how to avoid pregnancy, and private physicians were considered best at staff competence, privacy and friendliness (features that were more highly valued).

In one last analysis, we summed the 25 scores to create a total score for each type of provider. The mean was 60.23 for private physicians, 56.88 for public health clinics and 44.43 for voluntary organizations. A multivariate analysis of variance was statistically significant (F [2,563]=25.11, p<0.0001), indicating that low-income women saw real differences between these different delivery systems. All three total scores were positive, and the scores for public health clinics and private physicians were not significantly different from each other; both, however, were noticeably higher than the score for voluntary organizations.

A multivariate analysis of variance using these total scores generated a signifi-

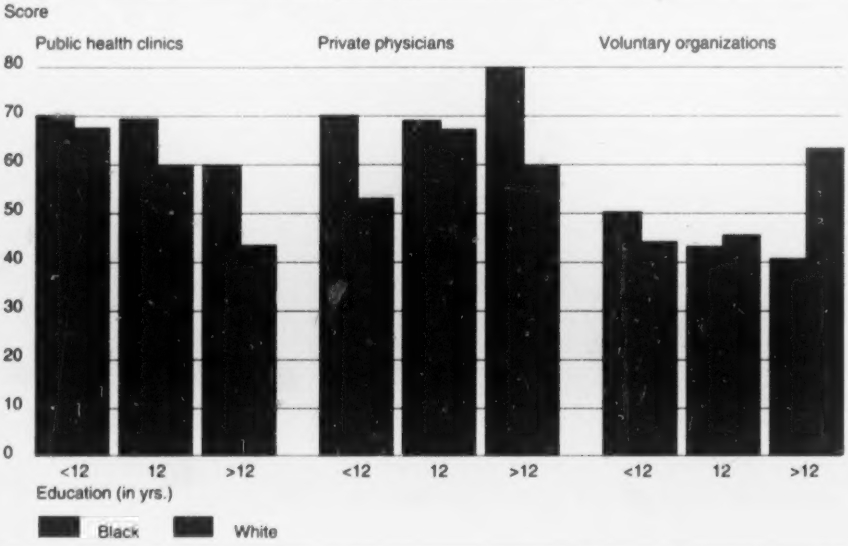

Figure 1. Mean scores for family planning services, by type of provider, according to women's years of education and women's race

cant interaction between the site at which the respondent was recruited and the scores for the types of providers (F [4,1126]=6.53, $p<0.0001$). Data suggest that family planning clients recruited at public health clinics viewed such clinics and private physicians much more favorably than they did voluntary organizations; on the other hand, those who were surveyed at voluntary organizations were more favorably disposed toward private physicians and voluntary organizations than toward public health clinics.

There were statistically significant interactions between type of family planning provider and educational level (F [4,1116]=3.72, $p<0.005$), between type of provider and ethnicity (F [2,558]=8.73, $p<0.0002$) and between type of provider, educational level and ethnicity (F [4,1116]=2.41, $p<0.05$). Further, the summed expectancy-value products of the three different types of providers were affected by educational level and ethnicity (F [1,559]=6.86, $p<0.01$).

Additionally, ethnicity in itself demonstrated different responses, as is seen in Figure 1. At all educational levels, blacks found more reasons to support public health clinics than did whites. Although both blacks and whites with more than a high school education reported lower scores than less educated women, the differences between the two well-educated groups were larger than differences by race among women with 12 or fewer years of education. Support for private physicians followed a different pattern: Blacks and whites with high school degrees demonstrated similar levels of support, but among those with either less or more education, blacks were more positive about private physicians than were whites. As for voluntary organizations, whites with more than a high school degree were more supportive of such services than were blacks.

Discussion

The foregoing analyses of low-income women's attitudes toward and perceptions of family planning services demonstrate that choice is influenced both by demographic and by cognitive and motivational factors. Ethnicity influenced ratings dramatically, with black respondents clearly more favorable toward public health clinics and private physicians than were whites; conversely, whites seem to have a more positive perception of the services offered by voluntary organizations than did blacks. To a lesser extent, education and number of children influenced support for the various types of providers. Other demographic factors, such as marital status, income level (within the poverty range), town size and age, were not related to attitudes toward and choice of family planning provider.

The low-income women studied here easily distinguished between private physicians, public health clinics and voluntary organizations as sources of family planning services. It is clear that private physicians served as an ideal (perhaps a wish) for many of these respondents. This was particularly true among blacks: Their extremely high ratings of private physicians may have reflected an impression rather than actual experience with physicians.

Speculation on this point would not be necessary if data were available on these women's previous provider usage. However, the data obtained in this study do not address such issues. In fact, it would have been interesting to categorize data from current users of each type of provider according to whether they had experience with only that provider type or with the various types of agencies.

The application of the expectancy-value model was designed to allow for an understanding of the reasons these women have for choosing one family planning delivery system over another. The low-income women studied here seemed to have been most concerned with staff competence, the availability of medical expertise and the quality of interpersonal behavior and treatment. It was important to them that staff members be trustworthy, friendly, understanding and not bossy—about as important, in fact, as the staff being well trained and competent. The relative importance of all 25 features utilized in this investigation may be used as a guideline for the development of future family planning systems.

Low-income women's perceptions of the various delivery systems available to them served as the second critical component of the analysis. Both the clear distinctions and perceived similarities among types of providers are instructive. For example, women believed that a private physician would provide much more privacy than a public health clinic or a clinic operated by a voluntary organization. However, it is reassuring that these women believed that all three types of providers took the time to teach them how to take care of themselves and stay healthy.

In addition to the unique ratings for each feature, the patterns of perception scores for each delivery system are interesting. The overall values for the perception ratings for the private physician and the public health family planning services were nearly the same, while the values for voluntary organizations were considerably lower. There are several possible explanations for this differential. First, women may be less certain about the characteristics of voluntary organization services than they are about the other two. However, women's lack of familiarity with private physicians did not lead to lower scores for such providers. Alternatively, the women's perceptions of voluntary organizations may simply reflect lower expectations.

The full potential of the expectancy-value model is realized when values and perceptions are combined. For example, it does not matter whether a provider has a particular feature if that feature is not valued: A clinic's being frequented by a culturally diverse clientele may be desirable to some but not to others. These expectancy-value products have several implications that should be highlighted. First, for those needing specific information regarding women's reasons for choosing one type of provider over another, these scores are the best data available. One can note where a provider is doing particularly well and where one has problems. The scores might also be used to understand who switches from one type of delivery system to another, and why.

Our data indicate that clients of public health clinics may find problematic such characteristics as lack of privacy, potential embarrassment in talking to the staff, possible absence of a doctor if one is needed and higher cost than the women can afford. As for clients of private physicians, three areas seemed troublesome: difficulty in finding physicians, the possibility of embarrassment and, particularly, more costly services than low-income women would prefer. Finally, the women believed that voluntary organizations did not provide as much privacy as desired, may not have a physician available when one is needed and were costly. Cost was considered problematic for all three types of providers.

However, if remedial action is to be undertaken on the basis of these data, we must determine whether the problem is real or perceived. It may be, in fact, that there is not much privacy at clinics operated by voluntary organizations, but this perception may be based on a stereotype. This is true not only for areas of deficiency but for areas of advantage, such as some of the ratings of private physicians. The relevant question may be whether such perceptions would remain the same if these women had more experience with private physicians.

Several demographic factors—ethnicity, number of children and education—influenced the vast majority of these ratings. It remains possible that black women, those without children and those with little education may have very different concerns and perceptions with regard to their choice of family planning provider than white women, those with children and those with more than a high school education.

This model's success in shedding light on women's perceptions of different family planning providers suggests ways in which it could be used further. First, the entire questionnaire could be utilized at individual family planning sites, as part of an initial evaluation or continually over time to track how the program is doing. It could also be used to compare two different sites of the same type or to monitor the effect of social marketing aimed at altering low-income women's perceptions of a program. The voluntary organizations and public health clinics studied here clearly needed this type of marketing effort. The issue is whether consumers will come to choose these clinics because they offer high-quality services rather than for pragmatic reasons based upon financial and geographic considerations.

Thus, our approach provides for the application of findings to several policy issues. One can, for example, assess the overall acceptability of the different types of family planning providers, assess the similarity of or differences in opinion among various community subgroups, identify valued and expected features highly predictive of family program acceptability (the reasons for acceptance) and assess potential receptivity statistically, as well as assess change longitudinally. Other investigators have suggested that such an approach could "assist government decision makers in learning how members of a community will respond to the introduction of certain programs in the area. The method not only provides an index of acceptability, but an understanding of the basis of the acceptability."[25]

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Factors Associated with the Use of Court Bypass by Minors to Obtain Abortions

By Robert Wm. Blum, Michael D. Resnick and Trisha Stark

Summary

Interviews with minors at four Minnesota abortion clinics revealed that 43 percent used the court bypass option that is part of that state's parental notification statute. The proportion who did so increased with age and was most common among lower socioeconomic groups. A discriminant function analysis showed that perceived maternal supportiveness was a key difference between those who went to court and those who notified their parents. Young women who attended religious services frequently were less likely than those who did not to tell their parents of their abortion plans. Minors who notified only one parent—and still had to go to court under Minnesota law, which requires notification of both parents—were more likely than those who told neither to come from a single-parent household and to have good communication with their mother.

Introduction

Abortion has been a complex legal issue ever since the *Roe* v. *Wade* decision in 1973,[1] especially as the law applies to minors. Proponents of laws requiring parental involvement when minors seek abortions contend that because the procedure is surgical, parental consent is fundamental.[2] They also argue that abortion is a major life decision, and therefore it is in society's best interest not only to encourage but to mandate parental involvement, even when minors wish to avoid it. [3]

Fear of disapproval was only partly associated with the decision not to notify parents of the abortion; there were many other reasons, such as multiple family stresses, absent fathers and feelings of having betrayed the family.

Those opposed to such laws suggest that one cannot legislate intrafamilial communication, especially if it has not existed prior to a daughter's pregnancy.[4] For many young women, they argue, family life has been marked by extensive parental absences, violence and other disruptions.[5]

Currently, ten states require parental consent while five mandate parental notification. While U.S. courts have upheld parental notification statutes enacted by state legislatures, they have required a bypass procedure to allow for judicial review of these cases when minors are unable or unwilling to notify their parents.

In some instances, parental notification is defined by statute to mean notification of both biological parents. This is the case in Minnesota, for example, where a law requiring two-parent notification and allowing for judicial bypass was enacted in 1984. The law requires that abortion providers notify, by certified mail, both biological parents (including those never married or divorced) of their minor child's pending abortion within 48 hours of the procedure. Teenagers who cannot or will not notify both parents may use a "judicial bypass" whereby a judge determines whether or not the minor is sufficiently mature to make the decision herself, or if confidentiality is in her best interest. However, enforcement of the law had been barred in 1986 by a lower court decision. The U.S. Supreme Court, after examining the statute in the spring of 1990 (*Hodgson* v. *Minnesota*),[6] declared the two-parent notification requirement constitutional, as long as the bypass option is available. Five states have federal court stays on laws which will now be reconsidered in light of the Supreme Court decision. This article seeks to examine some of the issues relating to parental notification and court bypass procedures by identifying the characteristics of young women who have used the Minnesota court bypass and determining how those who have gone to court after notifiying one parent differed from those who have told neither.

Methods

Four clinics participated in the study; their clients account for more than 75 percent of all minors who have abortions in Minnesota. All minors undergoing abortions in these facilities during a three-month period in 1984 were invited to enroll in the study. The young women were asked to complete written questionnaires as well as face-to-face interviews and were assured of confidentiality; they received $10 for their participation. All data were collected in the clinic on the day the procedure was done. A total of 174 subjects took part in the study, for an overall participation rate of 82 percent. Twenty-six subjects were subsequently excluded from data analysis for one or more of the following reasons: The subject was an emancipated minor (she had one or more children); she was a resident of a state other than Minnesota; or her data set was incomplete. The final sample was 148 minors.

Of those young women, 133 (91 percent) were white, nine (six percent) were black and two each were Native American (one percent) and Asian (one percent). One percent had missing data. Subjects were nearly equally distributed between rural

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(34 percent), suburban (38 percent) and urban (28 percent) residents. Over half of respondents (52 percent) lived with both biological parents. The proportion of whites for whom this was true (55 percent) was twice that of blacks (27 percent). Five percent of the sample (four young women) were 13 years old, and the same proportion were 14; 20 percent were 15 years old, 34 percent were 16; and 39 percent were 17. Socioeconomic status, as measured by the Hollingshead Two Factor Index of Social Class Position,[7] showed 19 percent to be in the two highest strata, 30 percent in the middle stratum and the remaining 51 percent in the lowest two socioeconomic strata.

The religious affiliation of those seeking abortions showed essentially no differences from the statewide distribution: Twenty-nine percent were Catholic, 66 percent were Protestant, five percent were atheist or agnostic, and one percent were "other." There was a wide distribution in the frequency of attendance at religious services over the previous three months: While 41 percent of respondents had attended no services, 25 percent had attended 10 or more. Some 20 percent had attended 1–3 services, while another 15 percent had attended 4–9.

Results

Sixty-four minors (43 percent of the sample) in the present study went to court to seek certification as competent to consent for an abortion; 16 of these young women had notified one parent. The proportion of minors using court bypass increased with age, from zero percent of those aged 13–14, to 36 percent of those aged 15, 45 percent of those aged 16 and 56 percent of those aged 17. Eighty-five percent of all minors seeking court certification were 16 years of age or older.

Young women who notified both parents were no more likely to come from an urban area than a suburban or rural one; the same was true for those who went to court. Valid ethnic comparisons are impossible because of the small numbers of all groups except whites, but it is noteworthy that all four black youths who went to court had notified one parent, whereas only 12 of the 60 whites had done so. Young women from the lowest two socioeconomic strata were significantly less likely than their wealthier peers to go to court ($X^2=4.08$, $p<0.05$).

Besides comparing minors who sought court bypass with those who did not, we used discriminant function analysis to identify those factors that best differentiated the two groups. Additional analyses compared young women who notified neither parent before going to court and those who went to court having told one parent (which was, with one exception, always their mother).

For the analyses comparing minors who notified both parents with those who went to court instead, 28 subjects had at least one missing discriminating variable; thus, the sample decreased to 120 subjects. Of these, 61 had notified both parents and 59 had not. We entered 21 variables into the equation in a stepwise manner; a variable had to account for at least one percent of the variance in group classifications to remain in the model. Five variables were able to explain nearly 21 percent of the variance in group membership and correctly classify 69 percent of cases. The table below shows the variables associated with notifying both parents:

Variable	Wilks lambda	Significance
High perceived maternal support	0.9245	0.0024
Young age of subject	0.8813	0.0006
Low socioeconomic status	0.8484	0.0003
Living with both parents	0.8256	0.0002
Infrequent religious service attendance	0.7939	0.0001

While a discriminating power of 21 percent is not extremely strong, some of the differences found are worth noting. Perceived maternal supportiveness was the key discriminating factor between those who notified parents and those who went to court. (This perception was unrelated to whether the mother had had discussions with her daughter about sexuality.) The interviews repeatedly demonstrated that teenagers who were not close to their mothers were unlikely to turn to them: "I've never been able to talk to my mom. I keep thinking what she would do if she found out, like kick me out of the house," one participant said. A young woman's closeness with her father, on the other hand, added only one percent to the discriminating power of the five-variable model.

Furthermore, religious observance appears to be inversely related to parental notification: Minors who reported the most frequent attendance at religious services (10 or more times in the previous three months) were significantly less likely than those whose attendance was less frequent to tell both parents of their abortion plans ($X^2 = 6.05$, $p<0.05$). This attitude, too, was reflected repeatedly in interview comments. As one young woman explained it, "My parents are very religious and against abortion. They would not trust me any more if I told them; it would mess up my relationship with them right now."

We conducted a second analysis to clarify the differences between those who notified one parent and those who notified neither. Because of missing discriminating variables, we used a sample of 53 minors who went to court—12 who had notified one parent and 41 who had told neither. We entered into the equation the same 21 variables used initially, following the same criterion for their inclusion in the final model. Seven variables explained over 44 percent of the variance in group membership and correctly classified 87 percent of cases. The following table indicates the variables associated with notifying neither parent:

Variables	Wilks lambda	Significance
Living with both parents	0.8810	0.0114
Poor communication with mother	0.7664	0.0013
Self as primary decision-maker	0.6085	0.0003
Good communication with father	0.6213	0.0001
Perceive parents as controlling	0.5915	0.0001
Discuss sex with father	0.5754	0.0002
Frequent religious service attendance	0.5588	0.0003

This analysis made it clear that the young women who notified one parent and those who notified neither came from families with substantially different dynamics. Specifically, those who told neither parent were more likely to live with both parents and to see communication with their mother as less open. Fathers appear to have had the opposite effect; when communication was good and they had been open about sexual matters, their daughters were less likely to discuss the abortion decision with them. One of the teenagers said: "I was going to [tell him], and then I just knew he would be disappointed and hurt. I thought it would be better if he did not know." Explained another: "I'm Dad's little girl, and I think he would get upset." Finally, teenagers from families where parents exercised a high degree of control (as measured by the Moos Family Environment Scale[8]) and those from more religious families were relatively unlikely to discuss their abortion plans with either parent.

Discussion

During the past 15 years, a substantial amount has been written on abortion decision-making by adolescents; more recently, there has been a growing body of research on the impact of parental notification statutes.[9] A study of the impressions of juvenile court judges found that judges believe young women who use the court bypass are disproportionately Caucasian, middle- and upper-class, and predominantly suburban.[10] The present study suggests that the judges were correct in their impressions of minors' economic status but not of residential or ethnic background. The major ethnic difference noted here is that all black youths who sought judicial bypass did so after notifying their mother. This may be partly because mothers headed the households of 64 percent of the blacks in the study, as compared with 28 percent of whites. Another impression of the judges was that a significant number of youths come to court after notifiying their mother.[11] Our present study supports this observation as well.

A 1982 examination of patterns of parental notification among Minnesota youth found that young minors were more likely than older teenagers to involve their parents.[12] Similarly, we found that young teenagers always notified their parents; this finding suggests that older adolescents were far more likely to have the social and psychological resources necessary to use the court option.

Previous research has not described the distinct differences between those juveniles who come to court having notified one parent and those who seek judicial bypass so as to notify neither. The young women in our sample who went to court were far more likely than others to come from a home where the father was physically or emotionally absent; those who notified just their mother described relatively good communication with her.

Several studies have found that among both blacks and whites, the mothers of pregnant teenagers are the key influence for adoption and abortion decisions. When the decision is made to keep the baby, however, a boyfriend's influence is greater than the mother's among white females.[13] In addition, the father's influence on sexual decisions falls dramatically behind that of both mother and boyfriend, according to a study exploring key influences on adolescent abortion decision-making.[14] The present study suggests a catch-22 for the father: If he is absent, he is irrelevant and thus not informed; if he is compassionate and open, his daughter does not want to disappoint him.

Many proponents of parental notification requirements believe that if parents become involved in their daughter's abortion decision they will try to persuade her not to go through with the procedure, although one study found the opposite to be true.[15] Similarly, among our sample, avoidance of parental notification was only partly due to perceived parental disagreement with the decision. There were many other reasons for not notifying parents: an absent father, multiple concurrent family stresses, family violence, parental substance abuse and a feeling of having "betrayed" the family by becoming pregnant. Many minors went to court expressing the same sentiments of one young woman who said: "I wanted to [tell my parents] but I knew they would be disappointed in me. I thought I should do this on my own—it was my problem. They would have agreed with my decision."

A study we published previously compared the notification patterns of adolescents in Minnesota (which has [illegible] parental notification requirement) and in Wisconsin (which has none).[16] We found no significant difference between the states in the proportion of adolescents who notified one or both parents, which suggests that other factors were more salient in promoting or inhibiting parental notification than a law aimed at encouraging such communication. The multivariate models presented in this article indicate the importance in notification decisions of teenagers' perceptions of the quality of their relationship with their mother. It is a peculiarity of the Minnesota notification requirement that even if an adolescent notifies one parent (who may accompany her to court), the law does not recognize that parental influence or guidance. In addition to questioning the utility of a law that has been shown to be ineffective in promoting parent notification, one must question the wisdom of undermining the authority of the single parent who is notified by requiring notification of the second, typically absent, parent.

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The Impact of Public-Sector Expenditures For Contraceptive Services in California

By Jacqueline Darroch Forrest and Susheela Singh

Summary

A methodology previously used to calculate the number of unintended pregnancies averted nationally through publicly funded contraceptive services has been adapted for a state-level analysis in California. An estimated 136,800 unintended pregnancies—which would result in approximately 36,000 births, 85,100 abortions and 15,700 miscarriages—are averted each year because publicly funded contraceptive care is available from clinics and private physicians in California. Federal and state expenditures of $46 million for contraceptive services in California in FY 1989 resulted in an estimated savings of $232–$509 million in public costs for abortions, for prenatal and maternity care and for medical care, welfare and supplementary nutritional programs during the first two years after a birth. These savings represent an average of $7.70 saved for each dollar spent to provide contraceptive services. This savings/cost ratio is 75 percent higher than that previously estimated for the United States as a whole.

Introduction

The federal government provides the largest proportion of the public funds used for family planning in the United States. The programs through which such expenditures are made include Title X of the Public Health Service Act, Medicaid and the Social Services and Maternal and Child Health (MCH) block grant programs. Nevertheless, state governments have considerable control over how federal money is spent and most use some of their own funds for family planning as well.

"Should funding for contraceptive services [in California] be withdrawn, the additional unintended pregnancies—and the resulting births and abortions—would increase demands on already overburdened health and welfare services."

Through Title X, the only federal program dedicated specifically to supporting family planning clinic services, the federal government provided 32 percent of all public funds spent nationally on family planning services in 1987.[1] Most of the Title X money goes directly to state health departments for clinic operations, although some goes to nonprofit organizations.

In 1987, an additional one-third of public funding for family planning came from Medicaid. In this joint federal-state program, the federal government pays 90 percent of the cost of family planning services and the states pay the other 10 percent. Medicaid reimburses for services provided by private physicians as well as for those provided by clinics and other organized providers. The states determine which providers may receive Medicaid reimbursements and set reimbursement rates. They also determine who will be eligible to receive Medicaid-reimbursed services within federal guidelines: States must cover people receiving benefits through the Aid to Families with Dependent Children (AFDC) program, and may cover others as well.

States may also use funds from the Social Services and MCH block grant programs to provide family planning services, although they are not legally required to do so. (The federal government requires the states to match every four federal MCH dollars they receive with three state dollars; the Social Services block grant has no matching requirement.)

Most states also use their own funds for family planning clinic services. In FY 1987, the appropriations for such services in 41 states and the District of Columbia made up 19 percent of all public monies expended on contraceptive services. Between block grant expenditures and direct state appropriations, a total of 35 percent of all funds spent on family planning services in 1987 were directly controlled by the states.[2]

In addition to family planning funds, the states provide or control much of the funding for health and welfare services for poor women who become pregnant. The states determine eligibility criteria for AFDC and provide some of the funding for the program. Since the Hyde Amendment went into effect in 1977, almost all public money for poor women having abortions has come from state rather than federal sources. At their discretion, states may also provide Medicaid reimbursement for the pregnancy-related and infant medical care expenses of some low-income women who are not otherwise eligible for Medicaid.[3] The states must pay 20–50 percent of these Medicaid expenditures, according to their regular, non–family planning rate set by the federal government.

Because substantial funds are allotted at the state level, it is important to be able to estimate the impact of publicly funded contraceptive services in individual states

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Table 1. Average state expenditures per woman receiving publicly funded care, percentage of women meeting Medi-Cal income eligibility criteria who are estimated to receive such care and average public spending per birth or abortion to women meeting Medi-Cal income eligibility criteria, by eligibility status and type of expenditure, California, 1989

Medi-Cal eligibility and type of expenditure	Avg. spent per woman receiving publicly funded care	% eligible who get publicly funded care	Avg. spent per eligible woman
Enrolled			
Births	$9,383	na	$8,449
Maternity care	3,034	100.0	3,034
Infant care	3,089	100.0	3,089
AFDC	2,270	71.0	1,612
WIC	711	71.0	505
Food stamps	279	75.0	209
Abortions	362	100.0	362
Eligible for full coverage if pregnant			
Births	16,133	na	10,604
Maternity care	3,034	80.0	2,427
Infant care	3,089	80.0	2,471
AFDC	8,660	56.8	4,919
WIC	711	56.8	404
Food stamps	639	60.0	383
Abortions	362	80.0	290
Eligible for pregnancy-related coverage if pregnant			
Births	6,123	na	4,898
Maternity care	3,034	80.0	2,427
Infant care	3,089	80.0	2,471
Abortions	362	80.0	290

Sources: **Expenditures for maternity and infant health care**—C. D. Brindis and C. C. Korenbrot (see reference 5), inflated from 1987 to 1989 by the 8.93 percent increase between October 1987 and October 1989 in the consumer price index for the United States, U.S. Bureau of Labor Statistics, personal communication. **Expenditures for AFDC**—Special pregnancy grant information, C. D. Brindis and C. C. Korenbrot (see reference 5); regular AFDC benefit levels, I. Hill, National Governors' Association, personal communication; average time on AFDC, A. Torres et al., "Public Benefits and Costs of Government Funding for Abortion," *Family Planning Perspectives*, **18**:111, 1986. **Expenditures for WIC**—Monthly payment levels in California, U.S. Department of Agriculture, *Special Supplemental Food Program (WIC): Participation and Program Financing*, standard table, FY 1985; payment increase, 1985–1989, Department of Agriculture, personal communication, 1989; average time on WIC, A. Torres et al., 1986, op.cit. **Expenditures for food stamps**—A. Torres et al., 1986, op. cit., adjusted for inflation. **Expenditures for abortion**—C. C. Korenbrot, personal communication, December 1989. **Eligibility for maternity and infant health care**—C. D. Brindis and C. C. Korenbrot (see reference 5). **Proportion of those on Medicaid who receive AFDC**—U.S. Health Care Financing Administration, standard tables, 1986. **Proportion of those on Medicaid who receive WIC**—A. Torres et al., 1986, op. cit. **Proportion of those on Medicaid who receive food stamps**—A. Torres et al., 1986, op. cit. **Proportion of those on Medi-Cal covered by Medi-Cal for abortion**—C. C. Brindis and C. D. Korenbrot, personal communication, 1989.

Note: na=not applicable.

as well as in the country as a whole. However, not all states or localities have data comparable to those we used previously to calculate the number of unintended births, abortions and miscarriages that would occur in the United States each year—and their cost to the taxpayer—if publicly funded contraceptive services were not available.[4] Enough key information was available for California to allow us to make estimates specific to that state. This required adaptation of our original approach to other types of data, but it allowed us to explore possible differences between the estimates for the United States and those for California. By doing so, we were able to examine the sensitivity of the methodology to different assumptions. In addition, we were able to assess the stability of estimates based on different approaches by comparing our results for California with those calculated by Claire Brindis and Carol Korenbrot, who used a different methodology.[5] The potential contribution of these comparisons is practical as well as methodological, because state funding for family planning services has been an issue of intense political confrontation in California, and the question of whether taxpayers benefit by supporting such services has been an integral part of the debate.

This article presents the adaptation of our national analysis to California and compares the resulting estimates of the impact of federal and state expenditures with those we made for the United States as a whole and with those made for California by Brindis and Korenbrot.

Methodology

The approach we used for California followed the same four major steps as our U.S. calculations: determining the number and characteristics of women using reversible contraceptives obtained from publicly supported contraceptive providers; estimating the number of unintended pregnancies (and the distribution of those pregnancies by outcome) these women would experience under conditions of continued access to publicly funded services, as well as under four alternative scenarios of possible behavior if such services were not available; calculating the public-sector costs of medical care and social services for women who would be eligible for such services if they had a birth or abortion; and computing the savings to taxpayers resulting from public expenditures on contraceptive services. We used data for California if they were available; otherwise, we relied on national data.

• *Identifying contraceptive users who rely on publicly supported services.* To calculate the total number of women obtaining reversible contraceptive services from publicly funded providers, we needed estimates of how many such women received care from family planning clinics and how many used private physicians reimbursed by Medi-Cal, as the Medicaid program is called in California. Using data from the California State Office of Family Planning (OFP), we estimated that 460,300 women under age 50 were using a reversible contraceptive at the time of their last visit during FY 1989 (July 1, 1988, through June 30, 1989) to a publicly supported family planning clinic. Information on the women's contraceptive method, characteristics (age, race and poverty status based on family size and income) and source of payment was available for 362,200 of these women on computer tapes provided by the Los Angeles Regional Family Planning Council (146,700 women) and the OFP (215,500 women). Information on the other 98,100 women, who attended independent clinics, was not available from the OFP in time for this analysis; therefore, we assumed they were similar to the women who were on the OFP data tape.[6]

To estimate how many women received their services from private physicians reimbursed by Medi-Cal, we used data from the 1982 National Survey of Family Growth (NSFG) to calculate the ratio of physicians' clients to clinic clients among women whose services were paid for by Medi-Cal. (Data tapes from the 1988 NSFG were not available in time for use in this analysis.) Among NSFG respondents in the western United States who were using reversible contraceptives and were enrolled in Medicaid, 34 percent of those who had made a family planning visit in the previous year had gone to a clinic and 66 percent—1.94 times as many—had gone to a private physician. We had determined that 34,000 of the women making a clinic visit had their care paid for by Medi-Cal. By multiplying this number by 1.94, we estimated that 66,000 women had obtained a reversible contraceptive from a private physician reimbursed by Medi-Cal. According to these calculations, a total of 526,300 women obtained reversible contraceptives through publicly funded providers in FY 1989, with care for 100,000 of these women paid by Medi-Cal.

These 100,000 women were already eligible for publicly funded maternity care and infant medical care should they become pregnant. Our next step was to determine what the poverty status of the 426,300 clinic clients not currently enrolled in Medi-Cal would be if their income remained stable but their family were one person larger. This allowed us to determine what publicly paid benefits they would be entitled to if they became pregnant. The poverty-status ceiling for Medicaid eligibility varies by state. Because California sets its Medicaid eligibility ceiling at a higher level than the average for the United States, a much higher proportion of California women relying on publicly funded providers for contraceptive care meet state income and assets criteria. In FY 1989, for example, California women with family income and size equivalent to less than 106.5 percent of poverty were eligible for full Medi-Cal coverage. (In comparison, the average eligibility ceiling in the United States in 1989 was 53 percent of poverty.) In addition, California women whose income is between 106.5 and 185 percent of poverty are eligible for Medi-Cal coverage of pregnancy-related care (including abortion) and of health care for children up to age two. (In comparison, the U.S. average eligibility ceiling for expanded Medicaid in mid-1989 was 137 percent of poverty.) However, not all women in California who meet these income criteria qualify for Medi-Cal; they must also meet another criterion based on the value of their assets, including property.

•*Calculating the number of unintended pregnancies and their outcome.* We began this part of our analysis by estimating the number of unintended pregnancies that would occur among California women using reversible contraceptive services from publicly funded providers if these services were not available. We also estimated the number of women who would experience contraceptive failures and have unintended pregnancies, even with the current family planning services, as a baseline for comparison. The proportions of women who become pregnant within one year of beginning an interval of contraceptive use or of nonuse were based on NSFG data and were the same as those used in our national analysis. These national estimates were specific to each woman's age, race, marital and poverty status and contraceptive method; however, because data on the marital status of clients in California are not available, we estimated pregnancy rates for each age, race, poverty and method subgroup, weighted according to the proportions of all public-sector users in the United States in each subgroup who were married and unmarried. Finally, we used California data to estimate the proportions of unintended pregnancies that would end as births, abortions or miscarriages.

Our estimates of the number of pregnancies that would occur if publicly funded contraceptive services were not available were based on the four patterns of contraceptive behavior used in our national analysis. The first three were calculated from national data on the actual behavior of women in somewhat similar situations: Pattern I is based on the behavior of women at risk of unintended pregnancy who do not use publicly funded contraceptive services; Pattern II reflects the behavior of women who discontinue oral contraceptive use and do not switch to another prescription method; Pattern III is based on information about the contraceptive methods used by new family planning clinic clients before their first clinic visit.* Pattern IV assumes that if publicly funded services were not available, women at risk of unintended pregnancy would continue to be sexually active but would use no contraceptives; although this is not a realistic scenario, it provides an estimate of the overall contribution of publicly supported contraceptive services in California.

We had no data that would allow us to calculate the distribution of unintended pregnancies in California by outcome (birth, abortion or miscarriage); although the number of abortions in the state is known, data on the intention status of pregnancies leading to births are not available. It seemed inappropriate to use national estimates because the proportion of all pregnancies ending in abortion is higher in California (34 percent in 1985) than in the United States as a whole (25 percent).[7] If abortions make up the same proportion of unintended pregnancies in California as in the United States (47 percent), 72 percent of all pregnancies in California would be unintended, and this is unlikely. It is more likely that in California, the proportion of unintended pregnancies ending in abortion is higher, and the proportion ending in births lower, than in the United States as a whole, partly because Californians have better access to abortion. We therefore assumed that the proportion of pregnancies that are unintended is the same in California as in the United States (54 percent) and, accordingly, that 62 percent of unintended pregnancies in California end as abortions (34 [percent of pregnancies that end in abortion]/54 [percent of pregnancies that are unintended] = 62). Using standard assumptions about the proportion of pregnancies that end in miscarriage, we estimated that 12 percent of unintended pregnancies in California end in miscarriages and 26 percent in births. In this analysis, we have therefore assumed that a much smaller proportion of unintended pregnancies end in birth in California than in the United States overall (41 percent). Because the public-sector costs of care are much greater for women who give birth than for those who have an abortion, the use of these estimates rather than the U.S. figures is an important difference between the two sets of cost-benefit calculations. Finally, we have not used age-specific estimates to allocate unintended pregnancies by type of outcome as we did in the national analysis. Only two percent of public-sector clients in California are 40 or older, and in the United States, the distribution of unintended pregnancies by outcome varies little up to age 40. Therefore, our California estimates are based on the total number of unintended pregnancies.

•*Estimating public-sector costs.* Using California data, we calculated that a total of $46,014,000 in federal and state funds was spent for reversible contraceptive services in California in FY 1989. (This amount does not include expenditures for sterilization, infertility and abortion services, services to men, and information and education.) The state provided 60 percent of these funds ($26,839,000 from the OFP and $783,000 from the state component of Medi-Cal) and the federal government provided the remaining 40 percent ($7,049,000 from Medicaid, $10,275,000 from grants for family planning service delivery under Title X of the Public Health Service Act and $1,068,000 from special grants under the federal undocumented-alien amnesty program).

To estimate the public expenditures that might be incurred if women using publicly supported contraceptive services became pregnant, we calculated expenses for care mandated by law—abortion, medical care during pregnancy and birth and, for a period of two years after birth, infant and pediatric care, AFDC, food stamps and the Special Supplemental Food Program for Women, Infants and Children (WIC). Much of the information on the cost of these services in California came from

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*Under Pattern I, we estimated that 56 percent of clients would continue using their current method, 11 and 12 percent would switch to the condom or another nonprescription method, respectively, and 21 percent would remain at risk of unintended pregnancy but use no contraceptive. Pattern II assumes that 24 percent of the clients would use the condom and 28 percent would use another nonprescription method, while 28 percent would be at risk of unintended pregnancy but use no contraceptive and 20 percent would not be at risk of unintended pregnancy. For Pattern III, we assumed that 45 percent of the clients would continue using their current method and 55 percent would use no contraceptive while still being at risk of unintended pregnancy.

Table 2. Estimated annual number of unintended pregnancies, births and abortions among women receiving publicly funded reversible contraceptive services, by pattern of contraceptive use, according to Medi-Cal eligibility status, California, 1989

Pattern of use	Total*	Currently enrolled	Eligible if pregnant		Not eligible
			Full coverage	Pregnancy-related coverage	
CURRENT					
Pregnancies†	**51,200**	**11,300**	**33,700**	**5,200**	**1,000**
Births	13,500	3,000	8,900	1,400	300
Abortions	31,900	7,100	21,000	3,200	600
PATTERN I					
Pregnancies†	**141,000**	**28,000**	**92,900**	**15,900**	**4,200**
Births	37,100	7,400	24,400	4,200	1,100
Abortions	87,700	17,400	57,800	9,900	2,600
PATTERN II					
Pregnancies†	**174,400**	**33,800**	**115,300**	**20,000**	**5,400**
Births	45,900	8,900	30,300	5,200	1,400
Abortions	108,500	21,000	71,700	12,400	3,400
PATTERN III					
Pregnancies†	**248,500**	**48,000**	**163,000**	**29,000**	**8,500**
Births	65,400	12,600	42,900	7,600	2,200
Abortions	154,600	29,900	101,400	18,000	5,300
PATTERN IV					
Pregnancies†	**409,900**	**78,000**	**268,800**	**48,500**	**14,600**
Births	107,800	20,500	70,700	12,700	3,800
Abortions	254,900	48,500	167,200	30,100	9,100

*Rows may not add to totals because of rounding.

†Miscarriages are included among all unintended pregnancies but are not shown separately.

prior work by Brindis and Korenbrot.[8] We included estimates for the special prenatal cash grants available to women on welfare in California, but not generally available to women in other states. Our estimates also include costs of prenatal care, hospital costs for the mother and infant, including cesarean deliveries and neonatal intensive care, and well-baby care during the first two years of life. However, we did not try to include all possible expenditures, and our estimates are therefore conservative. Unlike Brindis and Korenbrot, we did not include longer term expenditures for foster care, adoption, day care, special education and services for disabled children. Our estimates also exclude costs for public housing, other social services and medical care for miscarriages or ectopic pregnancies.

The types of publicly funded services for which a pregnant woman is eligible, and the level at which those services are funded, depend on whether the woman is already receiving welfare and Medi-Cal, is a new recipient of welfare and Medi-Cal or qualifies only for Medi-Cal coverage of health care related to pregnancy and infant care. Therefore, we have calculated the average expenditures per birth or abortion both for women already receiving publicly funded health and welfare services and for those who would be eligible for Medi-Cal—either for full coverage or for coverage of pregnancy-related care only—if they were pregnant. These calculations, shown in Table 1 (page 162), indicate that among women whose care is paid for by public funds, the average expenditure per birth is $9,383 for those already enrolled in Medi-Cal, $16,133 for those who would be newly eligible for full coverage if they were pregnant and $6,123 for those who would be eligible only for coverage of maternity and infant care if they became pregnant. The cost for women newly eligible for benefits is higher than for those already enrolled, primarily because AFDC costs and food stamp costs for families entering welfare are higher than those for an expanding household already receiving benefits. The average Medi-Cal expenditures for maternity care and infant care are the same, regardless of women's enrollment status—$3,034 and $3,089, respectively, per woman.

Not all women enrolled in Medi-Cal receive AFDC and other benefits. Consequently, we estimate that for the average woman already enrolled, expenses would total $8,449 for medical care for pregnancy and childbirth, infant and pediatric care, additional AFDC payments and AFDC prenatal cash grants, food stamps and WIC; expenses per abortion would average $362. Some women who meet the income criteria for Medi-Cal do not receive coverage because they fail to meet California's subsequent assets criteria. Using conservative estimates by Brindis and Korenbrot of the proportion of women who meet the criteria and actually enroll in Medi-Cal, we assumed that among women not currently enrolled who would meet the income eligibility criteria if they became pregnant, only 80 percent would actually enroll and receive reimbursed maternal and infant care or abortion services.[9] Thus, the average expenditure per birth for maternity care for women who are not currently enrolled but would be eligible for Medi-Cal if they became pregnant was 80 percent of $3,034, or $2,427, and the average expenditures for infant care would be 80 percent of $3,089, or $2,471. Average total expenses for these women would be $10,604 per birth or $290 per abortion.

Finally, for women who would be eligible under expanded Medi-Cal provisions for care related to pregnancy only (abortion, prenatal and maternity care, and infant and pediatric care to age two), the average expenditure would be $4,898 per birth and $290 per abortion.

- *Estimating public-sector savings.* We calculated expenditures on care for pregnant women, with the family planning services provided in FY 1989 and under the alternative patterns if no family planning funding were available, by multiplying the expected number of births by the average cost per birth and the estimated number of abortions by the average cost per abortion, based on women's Medi-Cal enrollment and eligibility status. The difference between what would be spent under the alternate scenarios and what would be spent under FY 1989 service levels represents savings or expenditures averted.

Findings

- *Estimates for California.* Of the 526,300 women who obtained reversible contraceptives through publicly funded providers in California in FY 1989, an estimated 87.5 percent relied on family planning clinics and 12.5 percent received care from private physicians reimbursed by Medi-Cal. Clients tended to be young: At the time of their last contraceptive visit, 22.6 percent were younger than 20 and 32.6 percent were 20–24. Some 26 percent were nonwhite; race was unknown for 5.5 percent. Hispanics comprised 38.1 percent of the patients. In all, 19 percent were enrolled in Medi-Cal at the time of their visit. Regardless of Medi-Cal status, 76.0 percent had incomes below 106.5 percent of the federal poverty ceiling, and another 16.9 percent were between 106.5 and 185.0 percent of poverty at their last visit; seven percent had incomes greater than 185 percent of poverty. Based on estimates of what their poverty status would be if they were pregnant, 96.4 percent of women obtaining publicly funded contraceptive care in California would meet income criteria for some publicly paid care; 84.2 percent would be below 106.5 percent of poverty and 12.2 percent would be between 106.5 and 185 percent of poverty.

The majority of these women were using oral contraceptives or the IUD (78 percent); four percent were using a diaphragm, 14 percent relied on condoms and four percent were using other nonprescription methods. Using national estimates of pregnancy rates among women relying on these methods, we calculated that each year 51,200 (9.7 percent) of the California women relying on publicly supported providers become pregnant unintentionally; 13,500 give birth, 31,900 have abortions and the others have miscarriages (Table 2).

We estimated that if these women did not use contraceptives (Pattern IV), 409,900 unintended pregnancies would occur per year (358,700 more than if they continued using their current method), of which 107,800 would end in births and 254,900 would end in abortions (94,300 more births and 223,000 more abortions than with current method use). Thus, for every 1,000 women obtaining care from publicly funded providers in California, contraceptive use averts 681 unintended pregnancies (179 births and 424 abortions) annually.

Patterns I–III present more likely alternative behaviors than does Pattern IV: The latter assumes that none of the clients would use contraceptives if publicly funded services were not available. We estimated that, if women followed Patterns I–III instead of continuing their current contraceptive behavior, 141,000–248,500 would experience unintended pregnancies, of which 37,100–65,400 would result in births and 87,700–154,600 would end in abortions. By subtracting the number of unintended pregnancies that would occur if current use and access to care continued from the number that would occur under Patterns I–III, we calculated that 89,800–197,300 unintended pregnancies would be averted. If those unintended pregnancies occurred, 23,600–51,900 would be carried to term and 55,800–122,700 would be aborted.

Table 3. Estimated federal and state expenses averted (in 000s) through publicly funded reversible contraceptive services, by type of expense; and ratio of savings to costs; all according to patterns of contraceptive use, California, 1989

Measure	Pattern			
	I	II	III	IV
Total	**$232,251**	**$318,793**	**$508,704**	**$924,916**
Births	215,891	296,358	472,823	859,678
Medi-Cal: Woman	57,910	79,416	127,012	230,931
Medi-Cal: Infant	58,965	80,831	129,323	235,131
AFDC	83,637	115,016	182,836	332,429
WIC	8,501	11,647	18,611	33,839
Food stamps	6,878	9,448	15,041	27,348
Abortions	16,360	22,435	35,881	65,238
Savings/cost ratio*	**5.05**	**6.93**	**11.06**	**20.10**

*Total expenses averted divided by the $46,014,000 spent on contraceptive services in California in 1989.

Averaging the results of these three probable patterns of behavior, we estimated that 136,800 unintended pregnancies (36,000 births, 85,100 abortions and 15,700 miscarriages) are averted each year because publicly funded contraceptive services are available in California. This equals 260 pregnancies (68 births, 162 abortions and 30 miscarriages) averted annually for every 1,000 clients who obtain reversible contraceptives.

The estimated savings in public expenditures realized by preventing these unintended pregnancies range from $232 million for Pattern I to $509 million for Pattern III (Table 3), averaging $353 million. When related to the $46 million spent to provide contraceptive services in FY 1989, these scenarios yield savings per dollar spent of $5.05, $6.93 and $11.06, respectively, for an average of $7.68. The total contribution of publicly funded contraceptive services is even greater. If none of these clients were using contraceptives (Pattern IV), an additional $925 million in public expenditures would be required for women who would become pregnant. This would be equivalent to $20.10 for each dollar spent in FY 1989 for family planning services.

Half of the savings of public funds resulting from the provision of contraceptive services are in expenditures for medical care, almost evenly divided between care for the woman during pregnancy and birth and care for the infant. Thirty-six percent of savings are in AFDC costs, seven percent are in the food stamp and WIC nutritional programs and seven percent are in Medi-Cal expenditures for abortion.

•*Comparison with U.S. estimates.* Similarities and differences between the estimates for California and those calculated in our previous analysis for the United States as a whole provide some indication of the sensitivity of the results to the use of different assumptions. The estimated pregnancy rate among women using publicly funded contraceptive care in California (9.7 percent annually) is similar to the rate among such women in the United States as a whole (9.5 percent). Likewise, the estimate of the number of unintended pregnancies avoided per 1,000 users in California under Pattern IV is similar to the estimate for the United States as a whole—681 and 683 per 1,000, respectively—and the average of Patterns I–III is the same for both (260 per 1,000).

Despite the similarity in the rates at which unintended pregnancies are prevented, the amount saved per dollar spent on contraceptive services in California ($7.70) is much larger than the savings calculated for the United States as a whole ($4.40). We investigated the extent to which this discrepancy in the ratio of savings to dollars spent on contraceptive services resulted from differences in the costs of care for women with unintended pregnancies and from variations in the proportion of women obtaining publicly funded reversible contraceptive services who would be eligible for publicly funded health and welfare services if they were pregnant. The primary factor was that, in California, a much larger proportion of women receiving reversible methods from publicly funded providers would be eligible for publicly funded health and welfare services if they became pregnant.

Among women who receive publicly funded health and welfare services, the expenditure per birth in each eligibility group is approximately one-third higher in California than in the United States as a whole and the cost per abortion is lower. For example, the expenditures for those who are currently enrolled in Medicaid are $9,383 per birth and $362 per abortion

Table 4. Average federal expenditures per woman receiving publicly funded care, percentage of women meeting Medicaid income eligibility criteria who are estimated to receive such care and average public spending per birth or abortion to women meeting Medicaid income eligibility criteria, by eligibility status and type of expenditure, United States, 1989

Medicaid eligibility status and type of expenditure	Avg. spent per woman receiving publicly funded care	% eligible who get publicly funded care	Avg. spent per eligible woman
Enrolled			
Births	$7,103	na	$6,534
Maternity care	2,535	100.0	2,535
Infant care	2,039	100.0	2,039
AFDC	1,224	78.0	955
WIC	872	78.0	680
Food stamps	433	75.0	325
Abortions	411	57.6	237
Eligible for full coverage if pregnant			
Births	12,291	na	10,574
Maternity care	2,535	100.0	2,535
Infant care	2,039	100.0	2,039
AFDC	6,191	78.0	4,829
WIC	872	78.0	680
Food stamps	654	75.0	491
Abortions	411	0.0	0
Eligible for pregnancy-related coverage if pregnant			
Births	4,575	na	4,575
Maternity care	2,535	100.0	2,535
Infant care	2,039	100.0	2,039
Abortions	411	0.0	0

Source: J. D. Forrest and S. Singh (see reference 4).

Notes: Expenditures were calculated from 1983 data and adjusted by 24.5 percent for inflation; na=not applicable.

in California (see Table 1) vs. $7,103 per birth and $411 per abortion in the U.S. as a whole (Table 4).* The higher per-birth expenditures in California are offset somewhat by the smaller proportions of Californians with a poverty status below the eligibility levels for receiving Medi-Cal who actually receive Medi-Cal coverage for themselves and their infant (80 percent vs. 100 percent) and the lower proportion of those who are enrolled in Medi-Cal who actually receive AFDC and WIC (71 percent each compared with 78 percent across the United States). When we take this into account, the average per-birth expenditure for women enrolled in Medi-Cal is only 29 percent higher than the U.S. figure ($8,449 vs. $6,534) and the average expenditure per birth for women who would become newly eligible for full and partial Medicaid coverage is almost the same as the U.S. figure. As for abortion, the procedure is covered for 100 percent of women who meet all Medi-Cal criteria (income and assets) at the time of their pregnancy; in comparison, only 58 percent of Medicaid-eligible women in the rest of the United States receive coverage, and abortion is generally not covered for those who first become eligible for Medicaid because they are pregnant.

Because we assume that fewer unintended pregnancies end in birth in California than in the United States overall, the higher expenditures related to birth play a smaller role in determining the average expenditures per unintended pregnancy in the estimates for California than in those for the United States. Thus, the average expenditure per unintended pregnancy in each Medi-Cal eligibility group is lower in California than it is in the United States as a whole. The average expenditure per unintended pregnancy (the average of the per-birth and per-abortion expenditures weighted by the proportions of unintended pregnancies that end as births and as abortions) to women enrolled in Medi-Cal ($2,447) is 83 percent of the U.S. figure ($2,957). Among women in California who are not enrolled but who would meet the income eligibility criteria if they were pregnant, the average estimated public-sector expenditure per unintended pregnancy is only 64 percent of the U.S. estimate for those eligible for full coverage and 74 percent of the U.S. estimate for those eligible only for pregnancy-related services and infant care.

So, although the public expenditures per unintended pregnancy in California within each category of Medi-Cal eligibility are lower than those in the United States as a whole, the estimated saving per dollar spent on family planning services is 75 percent higher for California than for the United States. This is true primarily because more of the California women who rely on publicly funded providers for reversible contraceptive services meet income eligibility standards for receiving publicly funded health and welfare services if they become pregnant than do women in the United States as a whole. While the proportions of contraceptive users already enrolled in Medicaid or eligible only for pregnancy-related Medicaid coverage are lower in California than in the United States as a whole (19 percent vs. 24 percent and 12 percent vs. 25 percent, respectively), the proportion of California women who would be newly eligible for regular coverage if they were pregnant is much higher (65 percent vs. seven percent, respectively).

In part, this is because women relying on publicly funded providers for contraceptive care in California appear, on average, poorer than comparable women in the United States overall. In California, 76 percent of these women have incomes lower than 106.5 percent of the federal poverty level; in comparison, 1982 NSFG data show that less than a third of those in the United States who obtain care from publicly funded providers have incomes below 100 percent of poverty. A total of 93 percent of California women relying on publicly funded contraceptive services have incomes below 185 percent of poverty, compared with only 52 percent of their U.S. counterparts. (See appendix for a discussion of differences between clinic-based and survey-based information on the poverty status of users of publicly funded facilities.)

Independent of the poverty-status distribution of women using publicly funded contraceptive services, women in California are more likely to be eligible for publicly funded health and welfare services if they become pregnant, because the eligibility ceilings in California have been set at higher income levels than those in most other states. The income ceiling for regular Medicaid eligibility is about twice as high in California as the average in the United States (106.5 percent of the poverty level vs. 53 percent, respectively). For pregnancy-related care, the average income ceiling in California in 1989 was 185 percent of poverty; in the United States, it was 137 percent of poverty. Even if women in California and in the United States as a whole were evenly distributed across poverty levels, the different eligibility ceilings would result in more Californians being eligible for Medi-Cal and other publicly funded care.

Although the public-sector expenditures that would result if unintended pregnancies were not averted by family planning services are much higher in California than in the United States as a whole, even after adjusting for inflation ($2,580 vs. $1,519 per pregnancy), the cost of averting those pregnancies is not much higher in California than in the United States overall. The annual cost of contraceptive services per

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*The estimates of U.S. expenditures based on 1983 data were adjusted for inflation by 24.5 percent to make them more comparable to the 1989 California estimates. (See: Bureau of Labor Statistics, personal communication, April 2, 1990; U.S. Bureau of the Census, *Statistical Abstract of the United States 1989*, Table 760, p. 470.) The difference in expenditures per abortion may be overestimated because the average cost of abortion has increased less than the consumer price index.

averted unintended pregnancy in California in 1989 was $336, slightly less than the U.S. figure of $347.

The cost of preventing an unintended pregnancy in California is slightly less than the comparable cost in the United States as a whole; however, if that pregnancy is not prevented, average expenditures for publicly funded care would be greater in California because women in that state who use publicly funded services are more likely to be eligible for publicly funded medical, welfare and nutritional services.

•*Other estimates for California.* Brindis and Korenbrot estimated that for every state dollar spent on contraceptive services, California saves a total of $12.20.[10] Their approach differed from ours in three basic ways: While we included both federal and state expenditures, they focused only on state expenditures; while we based our estimates on women obtaining care from either family planning clinics or private physicians reimbursed by Medi-Cal and included all public expenditures for care from either type of provider, Brindis and Korenbrot based their estimates only on family planning clinic clients and included only expenditures for clinic services; and our analysis included expenditures for a different mix of benefits than did theirs. Our estimates included physician and hospital charges for prenatal and maternity care, while theirs included only hospital charges. We included expenditures for WIC and food stamps, which they did not include because no state funds are involved. On the other hand, Brindis and Korenbrot's estimates included charges for services that we did not cover: social service costs for adoption, for two years of foster care and day care and for care of disabled children and special education through age 17.

There were basic differences not only in the scope of the calculations and in the expenditures covered, but also in the methodology used for calculation. The estimates of the number of unintended pregnancies prevented per 1,000 women, the proportional distribution of those pregnancies by outcome, the average AFDC costs per birth and the estimates of the proportions of women who would be eligible for and receive various types of care were all different.

To compare our estimates with those of Brindis and Korenbrot, we calculated a savings/cost ratio from our data that used only those expenditures covered in both models (hospital maternity care expenditures, newborn and infant care, AFDC cash assistance and abortion). We included only the state portion of expenditures related to pregnancy—as reported by Brindis and Korenbrot, 50 percent of Medi-Cal costs related to birth, 100 percent of abortion costs and 35 percent of the AFDC payments—and only state funding for contraceptive services. We made no other adjustments for differences in methodology, in the average cost of services or in the proportions of women eligible for care. This yielded an estimate that the state of California saved $5.39 for each dollar it spent to provide contraceptive services. Recalculations of Brindis and Korenbrot's total savings/cost ratio that include only the expenditures covered in both models reduce it from $12.20 to $5.30, almost the same as the recalculated figure based on our data and model.

Discussion

This analysis shows that in California, as in the United States as a whole, publicly supported contraceptive services make an important contribution in preventing a substantial number of unintended pregnancies, in total dollars saved and in the ratio of savings to expenditures. A comparison of estimates for California with those for the United States shows both similarities and differences in the levels of these contributions. Although there were some differences in characteristics between the women using reversible contraceptives from publicly funded providers in California and those in the United States as a whole, the average rates of pregnancy and rates of averted pregnancy were similar. However, the estimated ratio of savings to costs is 75 percent higher for California than for the United States, primarily because the income ceilings below which California women are eligible for Medicaid coverage are set at levels higher than the average for the United States and because clinic data indicate that almost all women in California who use publicly funded contraceptive services would fall below these levels if they became pregnant.

The fact that the savings/cost ratio in California is higher than the average U.S. ratio indicates that this ratio is likely to vary by state. In applying the methodology developed for the United States as a whole to California, we were able to substitute California data for many of the key variables. However, many of these data items are not available for every state or locality. When that is the case, national figures can be used to estimate program impact at the state or local level. Such subnational estimates can be made by multiplying the number of clients using reversible contraceptives and the savings-to-expenditure ratio by the amount of public-sector funding for contraceptive services.

Comparison of the California and U.S. estimates suggests, but does not conclusively prove, that the number of unintended pregnancies averted per 1,000 women using reversible contraceptives obtained from publicly funded providers is quite stable. The factors most likely to affect the savings/cost ratio are the average expenditures per birth and per abortion for women who are eligible for various categories of publicly funded care, the proportion of women using publicly funded reversible contraceptive services who are in each of those eligibility categories and the proportion of the unintended pregnancies that end as births or as abortions. Comparison of data on poverty-status distribution obtained from the 1982 NSFG with information from clinic records suggests that estimates based on the NSFG, such as those in our national analysis, may substantially understate the proportion of women who are poor enough to be eligible for publicly funded care if they become pregnant and therefore may understate the savings/cost ratio.

The similarity of our estimate of the savings/cost ratio to that made by Brindis and Korenbrot, based only on state funding and comparable services, is more surprising than the difference between the California and the U.S. ratios. Although the two approaches were similar and both were based on family planning clinic information about the poverty status of clients, the methodologies and the estimates for some of the key variables were different. The similarity of results does not indicate that changes in the estimates would have no impact, but it does increase confidence in the validity of both of the analyses.

Should funding for contraceptive services be withdrawn, the additional unintended pregnancies—and the resulting births and abortions—would increase demands on already overburdened health and welfare services. For example, public facilities providing prenatal care are already overburdened, and it is unlikely that they could handle a greatly increased caseload. If they could not, and women did not receive appropriate prenatal care, maternal and infant morbidity would be likely to increase; this would raise expenses sharply, making the savings/cost ratio substantially higher than that estimated here.

Appendix

It is not clear whether Californians relying on publicly funded providers for contraceptive care are in fact poorer, or whether they appear so because different sources of data were used in the two analyses. In 1983, about four in five family planning clinic patients in California and in the United States as a whole were estimated to have family incomes below 150 percent of the federal poverty level. (See: *Organized Family Planning Services in the United States, 1981–1983*, The Alan Guttmacher Institute, New York, 1984, Table 13, p. 60.) However, according to the 1982 NSFG, only 43 percent of respondents who had visited a family planning clinic in the previous 12 months were below 150 percent of poverty. (See: W. D. Mosher, "Use of Family Planning Services in the United States: 1982 and 1988," *Advance Data from Vital and Health Statistics*, No. 184, 1990.) Therefore, the apparent difference between the proportion poor in California and in our U.S. analysis may result primarily from the fact that clinic records were the basis of the California estimates and the NSFG was the basis of the U.S. estimates.

Why a smaller proportion of clinic patients are poor according to NSFG data than according to clinic records is not completely clear. It is possible that women seeking to obtain free or low-cost services from a family planning clinic report themselves as being poorer than they are; in 1983, only about a quarter of family planning agencies required that clients requesting subsidized care present income verification such as a payroll stub, income tax return or rent receipt. (See: A. Torres, "The Effects of Federal Funding Cuts on Family Planning Services, 1980–1983," *Family Planning Perspectives*, **16**:134, 1984.) The quality of reporting on family size may also vary between these two sources.

A further important difference is that the NSFG's estimate of poverty is based on annual income, while clinic estimates are based on income in a short period immediately preceding the visit. Clinic records note the client's income and family status at the time of service, often basing calculations on weekly or monthly income, while the NSFG records total income over the previous calendar year and family size as of the time of the interview. Both factors vary from one point in time to another, especially among young women, who make up the majority of clinic patients. In fact, wide changes over a short period of time are not unusual. In 1981, 33 percent of clinic patients were under age 20, while only 24 percent of the NSFG respondents who had recently made a clinic visit were under age 20. Given fluctuations in employment status, it is likely that the short-term measure of income will produce a lower poverty-status distribution than total income for the year.

Both the quality of reporting and the time period on which income, family size and poverty status are based (and possibly other unknown factors) contribute to the differences in poverty-status distributions observed between clinic-based and survey-based data. Given the lack of information on the causes of the differences in poverty-status distributions, we cannot recommend one of these two sources of data on poverty status of publicly funded contraceptive users over the other.

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Research Note

Trends in Use of Oral Contraceptives—Data from the 1987 National Health Interview Survey

By Deborah Anne Dawson

Summary

Despite fluctuations in current use rates for oral contraceptives, ever-use of the pill has remained remarkably stable for all cohorts of U.S. women born since 1945. Approximately 80 percent of these women report having used the pill at some time. Average duration of use is about five years among cohorts who had access to the pill from their earliest reproductive years. Among women born before 1940, whites are more likely than blacks to have ever used the pill, but no racial difference is evident among women in later cohorts. Age at first use of the pill has declined with each succeeding five-year birth cohort. Black women are more likely than white women to have used oral contraceptives before age 18, but by age 25, about three-fourths of blacks and whites have used the pill. Among ever-users born before 1945, the majority began taking the pill after their first full-term pregnancy; this pattern is reversed among more recent cohorts.

Introduction

Oral contraceptives became commercially available in the United States in 1960. By 1965, 16 percent of married women aged 15–44 were using oral contraceptives, and 26 percent had done so at some time. Both current use and ever-use increased steadily through 1973; however, from 1973 to 1982, current use declined by almost one-half (from 25 percent to 13 percent among currently married women of childbearing age), while ever-use continued to rise.[1] Data from studies conducted by a private pharmaceutical company in 1982 and 1987 indicated a resurgence in current use of the pill between those years,[2] and nationally representative data from Cycle IV of the National Survey of Family Growth will soon show trends in use during the 1980s.

This article presents data from the 1987 National Health Interview Survey (NHIS) on lifetime use of oral contraceptives for U.S. women aged 18–67. For the five-year birth cohorts of 1920–1924 through 1965–1969, it shows ever-use of the pill, use prior to selected ages, duration of use and timing of use with respect to first full-term pregnancy. Data are shown for black and white women separately and for women of all races combined.

Methodology

The NHIS is a continuous, cross-sectional household interview survey conducted by the National Center for Health Statistics. Each week, a probability sample of the civilian, noninstitutionalized population of the United States is interviewed by personnel of the U.S. Bureau of the Census. Interviewers collect information on the health and sociodemographic characteristics of all members of each household in the sample. Every year, special health topics of current interest are added to the basic core of questions that is repeated from year to year.

In 1987, the National Center for Health Statistics and the National Cancer Institute collaborated on two special NHIS studies. The Cancer Epidemiology Study included questions on a variety of known or suspected risk factors for cancer, including reproductive hormone use, while the Cancer Control Study examined preventive behaviors, such as screening examinations. One adult from each household was randomly selected to participate in the cancer studies and was systematically assigned to receive one or the other of the questionnaires. For the Cancer Epidemiology Study, on which this analysis of pill use is based, a total of 22,080 questionnaires were completed; an additional 22,043 adults were interviewed for the Cancer Control Study. The overall response rate for both studies was 82 percent.

Data on oral contraceptive use were collected from all women interviewed in the Cancer Epidemiology Study, which was restricted to persons aged 18 and older. The sample was further restricted to women who were no older than 40 at the time the pill was commercially introduced in 1960, since numbers of users among older women were too small to produce reliable estimates. Thus, the analysis is based on responses of 12,747 women born between 1920 and 1969, who were 18–67 years of age when interviewed in 1987.

Because the NHIS Cancer Epidemiology Study examined the pill as a potential risk factor for cancer rather than as a contraceptive method, the specific data collected differ substantially from those gathered in national fertility surveys. The greatest difference is that the NHIS did not determine whether women were at risk of unintended pregnancy at the time of pill use; that is, specific contraceptive intent was not ascertained. Another difference is that the NHIS did not ask about current use of the pill. Instead, respondents were asked whether they had ever used oral contraceptives for any reason. Those who said yes were asked the age at which they first used the pill and the total duration of use; breaks in usage of less than one month were counted as periods of use. Timing of first use in relation to first full-term pregnancy was determined by comparing the age at first use with the age at which the woman completed her first pregnancy lasting at least six months. If the two ages were the same, the order of the events could not be determined. Thus, there are three categories for timing of first use: before, at the same age as, and after the end of the woman's first full-term pregnancy.

The data presented here have been weighted to represent national totals. Be-

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Table 1. Percentage of all women and ever-married women who have ever used oral contraceptives, by birth cohort, according to race, United States, 1987

Birth cohort	Age at interview*	All women						Ever-married women					
		Total†		White		Black		Total†		White		Black	
		%	N	%	N	%	N	%	N	%	N	%	N
1920–1924	63–67	9.3	856	10.2	731	3.0	115	9.7	811	10.4	69	3.3	106
1925–1929	58–62	21.6	752	22.5	650	14.4	90	22.1	720	23.0	624	14.9	86
1930–1934	53–57	32.5	700	34.0	576	27.1	102	33.1	656	34.4	540	29.2	94
1935–1939	48–52	46.9	704	48.2	578	42.4	112	47.9	655	49.1	546	43.8	96
1940–1944	43–47	67.9	830	69.1	675	70.1	133	70.7	770	71.5	641	71.6	111
1945–1949	38–42	80.6	1,224	82.5	987	75.4	200	81.9	1,117	83.6	922	78.1	160
1950–1954	33–37	80.6	1,497	82.1	1,197	81.9	249	82.7	1,292	84.3	1,059	85.4	184
1955–1959	28–32	79.4	1,556	80.5	1,223	81.5	297	82.9	1,223	83.3	1,012	86.5	187
1960–1964	23–27	78.2	1,409	79.0	1,123	77.9	251	85.4	883	86.1	763	84.8	97
1965–1969	18–22	49.5	931	49.4	706	55.1	192	80.4	254	82.0	215	63.5	31

*Ages are approximate because interviewing took place throughout 1987; thus, some of the women born in the most recent year of the five-year cohort may have been one year younger than the age range indicated.

†In this and subsequent tables, totals include other races, which are not shown separately.

cause of the complex, multistage sample design of the NHIS,[3] standard errors of estimates are about 25 percent larger than would be the case if a simple random sample of equal size had been used. (Standard errors were calculated using SESUDAAN,[4] a SAS-based software package designed for analyzing data from complex sample survey designs.) Because of the amount of data presented in each table, individual standard errors are not included; however, all differences cited in the text are statistically significant (p<0.05).

Table 2. Cumulative percentage of women who have ever used oral contraceptives at selected ages, by race and birth cohort

Birth cohort	N	Age									
		15	18	20	25	30	35	40	45	50	55
Total											
1920–1924	895	0.0	0.0	0.0	0.1	0.4	1.6	3.7	6.8	8.2	9.3
1925–1929	732	0.0	0.0	0.2	0.4	2.5	6.2	16.5	19.3	20.8	21.6
1930–1934	681	0.0	0.0	0.1	3.0	9.0	22.3	29.4	31.6	32.0	32.5
1935–1939	686	0.0	0.1	0.3	8.9	28.9	39.9	45.0	46.5	46.9	46.9*
1940–1944	783	0.1	0.4	4.8	43.5	62.0	66.9	67.9	67.9	67.9*	na
1945–1949	1,193	0.2	4.1	21.5	66.8	77.2	80.1	80.6	80.6*	na	na
1950–1954	1,476	0.5	9.6	34.2	72.3	78.4	80.4	80.6*	na	na	na
1955–1959	1,539	1.1	18.6	44.9	72.1	78.6	79.4*	na	na	na	na
1960–1964	1,397	2.2	22.9	47.1	76.0	78.2*	na	na	na	na	na
1965–1969	922	1.8	24.9	44.3	49.5*	na	na	na	na	na	na
White											
1920–1924	721	0.0	0.0	0.0	0.1	0.5	1.8	4.2	7.6	9.0	10.2
1925–1929	630	0.0	0.0	0.2	0.4	2.5	6.6	17.1	20.1	21.7	22.5
1930–1934	557	0.0	0.0	0.0	2.7	8.4	23.2	31.1	32.9	33.4	34.0
1935–1939	562	0.0	0.1	0.3	9.6	30.3	40.9	46.2	47.9	48.2	48.2*
1940–1944	651	0.1	0.5	5.3	46.0	64.0	68.0	69.1	69.1	69.1*	na
1945–1949	963	0.3	4.0	23.0	70.0	79.5	82.1	82.5	82.5*	na	na
1950–1954	1,182	0.6	9.4	35.0	73.9	79.9	81.9	82.1*	na	na	na
1955–1959	1,214	0.9	17.3	44.6	73.0	79.5	80.5*	na	na	na	na
1960–1964	1,117	1.7	21.1	46.5	76.5	79.0*	na	na	na	na	na
1965–1969	700	1.6	23.2	43.9	49.4*	na	na	na	na	na	na
Black											
1920–1924	114	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	3.0	3.0
1925–1929	90	0.0	0.5	0.5	0.5	3.1	3.1	13.1	13.2	14.4	14.4
1930–1934	102	0.0	0.0	0.7	5.0	12.7	20.0	21.9	27.1	27.1	27.1
1935–1939	110	0.0	0.0	0.0	6.3	20.3	36.0	40.9	41.7	42.4	42.4*
1940–1944	125	0.0	0.2	2.4	33.9	60.5	69.2	70.1	70.1	70.1*	na
1945–1949	193	0.0	5.9	15.7	55.8	71.2	75.4	75.4	75.4*	na	na
1950–1954	246	0.0	13.5	36.5	75.3	80.8	81.6	81.9*	na	na	na
1955–1959	289	2.6	31.5	53.3	75.6	81.2	81.5*	na	na	na	na
1960–1964	246	5.5	38.1	55.9	77.3	77.9*	na	na	na	na	na
1965–1969	190	2.1	36.8	52.7	55.1*	na	na	na	na	na	na

Note: na=not applicable.

*Estimate is conservative, because not all women in cohort have reached age in question.

Ever-Use and First Use

Approximately eight of every 10 women born between 1945 and 1964 reported ever having used oral contraceptives (Table 1). These women were approximately 23–42 years of age when interviewed in 1987. Among earlier cohorts, the proportion was lower, ranging from nine percent among women born in 1920–1924 to 68 percent among those born in 1940–1944. Only 50 percent of the women in the 1965–1969 birth cohort had used the pill, but this figure will undoubtedly increase as the cohort ages. In 1987, these women were only 18–22 years old.

The proportion reporting oral contraceptive use was higher among ever-married women than among all respondents. This difference was especially pronounced among the more recent birth cohorts, where the proportion never married was the greatest. Eighty percent of ever-married women born between 1965 and 1969 had used the pill, compared with 50 percent of all women in that cohort.

Among women born before 1940, whites were more likely than blacks to report use of the pill; the average proportions of white and black users were 28 percent and 21 percent, respectively, for all women in the 1920–1939 birth cohorts combined. However, within each five-year cohort, none of the racial differences is statistically significant, except in the first cohort (1920–1924). For the cohorts born between 1940 and

1964, there were virtually no racial differences in ever-use. In the youngest cohort (1965–1969), there was little difference in ever-use among all women by race, but ever-married white women were more likely than their black counterparts to have used the pill (82 percent vs. 64 percent).

Table 3. Percentage distribution of women who have ever used oral contraceptives, by duration of use (in months), and average number of months of use, according to race and birth cohort

Birth cohort	N	Mos. of use						Avg. mos. of use
		0–11	12–36	37–59	60–119	≥120	Total	
Total								
1920–1924	68	18.5	23.5	8.4	25.3	24.3	100.0	63.2
1925–1929	138	21.4	23.9	16.5	18.0	20.2	100.0	58.4
1930–1934	214	25.0	23.5	11.4	20.6	19.5	100.0	58.4
1935–1939	313	24.7	23.5	13.4	22.1	16.2	100.0	51.3
1940–1944	555	17.5	20.0	15.4	26.8	20.3	100.0	60.8
1945–1949	944	17.4	23.0	14.8	25.5	19.3	100.0	60.6
1950–1954	1,165	15.3	23.4	17.8	27.3	16.3	100.0	56.2
1955–1959	1,171	16.0	23.1	19.0	28.5	13.4	100.0	52.7
1960–1964	1,062	18.5	28.4	24.3	27.1	1.7	100.0	38.0
1965–1969	495	27.6	41.1	25.6	4.8	0.9	100.0	24.3
White								
1920–1924	65	19.3	23.6	8.5	23.4	25.2	100.0	63.7
1925–1929	126	20.3	23.5	16.2	18.9	21.1	100.0	60.7
1930–1934	186	26.5	22.7	10.9	20.3	19.6	100.0	58.3
1935–1939	266	25.7	23.7	12.1	23.3	15.2	100.0	49.8
1940–1944	463	16.9	19.8	15.8	27.5	20.0	100.0	61.4
1945–1949	786	17.0	23.3	13.6	26.4	19.7	100.0	61.5
1950–1954	946	14.1	23.5	17.8	28.5	16.1	100.0	57.2
1955–1959	924	15.5	23.8	19.1	29.3	12.3	100.0	52.1
1960–1964	858	18.7	29.0	23.8	26.8	1.7	100.0	37.8
1965–1969	368	28.0	41.9	24.5	4.7	0.9	100.0	23.9
Black								
1920–1939*	82	15.4	25.8	18.3	19.6	20.9	100.0	60.0
1940–1944	83	18.7	22.7	9.7	23.0	25.9	100.0	60.4
1945–1949	138	18.8	20.6	21.2	21.5	17.9	100.0	57.8
1950–1954	195	19.7	22.1	18.3	23.1	16.8	100.0	53.4
1955–1959	234	19.8	18.6	13.1	26.7	21.8	100.0	59.1
1960–1964	188	14.5	25.6	25.8	31.9	2.2	100.0	41.3
1965–1969	116	19.6	42.6	31.6	6.2	0.0	100.0	25.7

*In this table and in Table 4, the birth cohorts of 1920–1939 were merged to yield a sufficient number of ever-users upon which to base estimates.

Table 2 shows the cumulative proportions of women who reported ever-use of oral contraceptives prior to certain ages. Differences among cohorts reflect both trends over time in age at initiation of sexual and contraceptive activity and the cohorts' varying ages at the time the pill was introduced. When the pill became commercially available in 1960, the women in the 1920–1929 birth cohorts were aged 30–39, those in the birth cohorts of 1930–1939 were 20–29, and those born in 1940–1945 were 15–19. Since most of the women born before 1940 were already sexually active by 1960, differences in their age at first use are assumed to result primarily from their varying ages when the pill entered the market.

In each of the early cohorts, a small proportion of women reported first using the pill at ages that correspond to years before 1960. For example, two percent of women born in 1920–1924 claimed to have used oral contraceptives by age 35, or by 1955–1959. This category probably reflects misreporting of either age at first use or age at interview, but it also may include women who took other forms of estrogen for noncontraceptive purposes.

The pill was available by the time women born in or after 1945 (aged 18–42 at interview) reached the age of 15; thus, most of the variation in first use among these cohorts reflects differences either in age at first intercourse or in the interval from first intercourse to initiation of pill use. The proportion of women in these cohorts who had ever used oral contraceptives before age 30 remained constant at about 78 percent, while the proportion who had used the pill by younger ages increased steadily with each successive cohort, up until 1960–1964. For example, only four percent of the women born in 1945–1949 had used the pill before the age of 18, compared with 10 percent of those born in 1950–1954 and 19 percent and 23 percent, respectively, of those born in 1955–1959 and 1960–1964. The birth cohort of 1965–1969 did not differ much from that of 1960–1964 in use of the pill at young ages.

By race, there are differences in age at first oral contraceptive use, especially among the more recent cohorts (1950–1964). For example, among women born between 1955 and 1959 (aged 28–32 at interview), the proportion of blacks who had used the pill by age 18 was almost twice that of whites (32 percent vs. 17 percent). However, by the age of 25, the racial differential between recent cohorts disappears, with about three-fourths of both black and white women having ever used oral contraceptives.

Duration and Timing of Use

Table 3 shows the distribution of women who ever used oral contraceptives, by duration of use and the average duration of use per woman. Except for the youngest cohorts, whose experience was truncated at the time of the interview, average duration of use was generally close to five years. Approximately 40 percent of ever-users reported three or fewer years of use, and about 45 percent reported five or more years. Among the 1940–1949 cohorts (aged 38–47 at interview), one-fifth of ever-users reported taking oral contraceptives for 10 years or longer. The decline in prolonged use among the more recent cohorts probably reflects both their truncated experience and changes over time in concerns about extended use of the pill and use at later ages.

For most of the birth cohorts examined, there were no differences by race in duration of oral contraceptive use. However, in the 1955–1959 cohort, black women used the pill longer, on average, than white women (59 vs. 52 months). If this difference were attributable solely to earlier initiation of use by black women, we would expect mean duration of use to differ by race among later cohorts as well, since the racial differential in initiation of use was pronounced in all of these cohorts. However, black-white differences in duration of use are not statistically significant in the later cohorts; thus, the racial difference observed in the 1955–1959 cohort probably results partly from continued use of

Table 4. Percentage distribution of women who have ever used oral contraceptives, by timing of first use relative to first full-term pregnancy,* according to race and birth cohort

Birth cohort	N	Timing relative to first pregnancy			
		Before†	At same age	After	Total
Total					
1920–1924	66	8.0	0.8	91.2	100.0
1925–1929	127	10.8	1.0	88.2	100.0
1930–1934	205	9.5	2.5	88.0	100.0
1935–1939	304	11.9	3.4	84.7	100.0
1940–1944	535	31.7	7.5	60.8	100.0
1945–1949	940	53.2	12.2	34.6	100.0
1950–1954	1,159	67.3	11.7	21.0	100.0
1955–1959	1,179	72.0	9.9	18.1	100.0
1960–1964	1,062	75.8	10.6	13.6	100.0
1965–1969	505	77.3	12.8	9.9	100.0
White					
1920–1924	64	8.2	0.0	90.9	100.0
1925–1929	113	11.5	0.7	87.8	100.0
1930–1934	176	9.7	1.8	88.5	100.0
1935–1939	257	11.6	3.2	85.2	100.0
1940–1944	443	32.0	7.9	60.1	100.0
1945–1949	782	56.7	11.4	31.9	100.0
1950–1954	941	71.7	10.9	17.4	100.0
1955–1959	938	77.1	7.4	15.5	100.0
1960–1964	856	77.7	9.5	12.8	100.0
1965–1969	379	77.7	13.5	8.8	100.0
Black					
1920–1939	84	9.1	6.1	84.8	100.0
1940–1944	84	27.9	5.4	66.7	100.0
1945–1949	139	28.1	19.0	52.9	100.0
1950–1954	196	38.0	18.2	43.8	100.0
1955–1959	228	41.7	21.6	36.7	100.0
1960–1964	190	63.2	18.5	18.3	100.0
1965–1969	116	76.2	7.8	16.0	100.0

*Full-term pregnancies are defined as those lasting six months or more.

†Includes women who have had no full-term pregnancies.

the pill at older ages among blacks. As the cohorts of 1960–1969 age and their overall duration of use can be more accurately ascertained, a comparable racial differential in duration of use may develop among these women as well.

As shown in Table 4, the vast majority of oral contraceptive users born before 1940 began taking the pill after their first full-term pregnancy (i.e., the first pregnancy lasting six months or more). Most of these women had already begun or even completed childbearing when the pill became available. Even among women born between 1940 and 1944, who were still teenagers when oral contraceptives entered the market, 61 percent started pill use after their first full-term pregnancy. An additional eight percent initiated use at the same age as they completed their first full-term pregnancy; while some of these women may have used the pill before becoming pregnant, it is likely that most of them did so after their first birth.

During the 1960s, prescribing oral contraceptives to young, unmarried women became much more common, and the mean age at first birth rose as women postponed childbearing. These changes are reflected in the increasing proportions of women in the more recent cohorts who first used oral contraceptives before their first full-term pregnancy. Such women made up about 10 percent of the pre-1940 birth cohorts, 32 percent of the 1940–1944 cohort, 53 percent of the 1945–1949 cohort and more than 70 percent of those born in or after 1955. For the younger cohorts, this proportion probably will decrease with time, as additional women join the ranks of ever-users by initiating use after completing first or higher-order pregnancies.

In the cohorts of women born between 1945 and 1964 (aged 23–42 at interview), timing of first oral contraceptive use with respect to first pregnancy differed sharply for blacks and whites. Although black women initiated pill use at slightly earlier ages than white women, whites born in 1945–1959 were nearly twice as likely as blacks to have used the pill before their first full-term pregnancy. By the 1960–1964 cohort, this differential had decreased, and among women in the youngest cohort (1965–1969), blacks and whites were equally likely to have used oral contraceptives before their first pregnancy (76 percent and 78 percent, respectively).

Discussion

During the past three decades, the pill rose to prominence as the most widely used contraceptive method in the United States, then declined in popularity as contraceptive sterilization became more prevalent.[5] The data presented here document the important role of the pill in women's reproductive histories. While most women ultimately switch to another contraceptive method,[6] the great majority use the pill at some point in their lives. Women begin to use the pill at relatively young ages, almost always by age 25, and use it for about five years, on average.

Patterns of oral contraceptive use have shifted over time: The cohorts examined in this article vary according to prevalence of ever-use, age at first use and timing of first use with respect to pregnancy. These variations reflect changes in social norms and practices, as well as changes in the contraceptive distribution system, i.e., the emergence of family planning clinics and increased access for young and unmarried women. Racial patterns of use have tended to converge over time. This finding is most evident in the figures for timing of first use with respect to pregnancy. Among the cohorts born in the late 1940s and 1950s, white women were far more likely than blacks to have initiated use of the pill before their first full-term pregnancy. For the most recent birth cohort (1965–1969), however, this differential disappears. In addition, while blacks still tend to use oral contraceptives at younger ages than whites, the age at first use by whites has declined greatly: The proportion of white women reporting pill use by age 18 more than doubled between the 1950–1954 and the 1965–1969 cohorts.

Large numbers of U.S. women use oral contraceptives at early ages, before their first full-term pregnancy, and for relatively prolonged periods of time. Therefore, the potential health benefits and risks associated with oral contraceptive use have widespread public health implications. These benefits and risks have been widely discussed elsewhere, and three excellent reviews have been published recently.[7] Our data reinforce the need for continued research on the effects of oral contraceptive use on women's health.

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Special Report

At Pill's 30th Birthday, Breast Cancer Question Is Unresolved

By Frances A. Althaus and Lisa Kaeser

The 30th anniversary of the birth control pill has arrived. Sixty million women worldwide currently use the pill, 11 million in the United States alone.[1] Despite the time that has passed since its introduction, and its commonplace nature in today's society, the spotlight on this method of birth control has not dimmed. Public controversy and scientific scrutiny continue three decades after its introduction, largely because of the many unanswered questions about its long-term risks and benefits.

Two conferences were held this spring, for example, to address the question of whether oral contraceptives have protective, deleterious or no effects on the development of breast cancer among women. In early April in Atlanta, the Centers for Disease Control (CDC) and the National Institute of Child Health and Human Development (NICHD) convened a panel of reproductive health specialists at the request of the American College of Obstetricians and Gynecologists to discuss whether findings from recent research indicate a need for changes in prescribing practices related to sex steroid hormones, including those contained in the pill. In May in Irvine, Calif., the Institute of Medicine (IOM) gathered together epidemiologists, reproductive biologists and other scientists, at the request of the NICHD, to attempt to reconcile the findings from numerous studies on oral contraceptives and breast cancer and to outline research needs into the next decade.

About nine percent of American women will develop breast cancer at some time in their lives, with 150,000 new cases occurring each year.[2] The risk of developing the disease increases with age: From 28 of every 100,000 women at age 30, the number of new cases rises to 362 per 100,000 at age 70.[3]

Besides age, race and nationality, the major risk factors for breast cancer are thought to be early menarche, late menopause, childlessness, delayed childbearing, obesity, a history of benign breast disease and a family history of breast cancer. Several of these indicate that hormones play a role in the development of breast cancer, a theory supported by epidemiological evidence. Women whose ovaries do not secrete hormones do not get breast cancer, and those whose ovaries were removed at an early age are at a significantly decreased risk. This evidence has led researchers to investigate a possible association between oral contraceptive use and breast cancer. Eighty-two percent of all women in the United States who have used contraceptives at some time in their lives have used the pill.[4] Thus, should it be proven that pill use increases some individuals' risk of developing this disease, the psychological, contraceptive and epidemiological ramifications could be tremendous.

Epidemiological Overview

Whether oral contraceptive use is related to breast cancer is a complicated question, particularly because the pill itself has undergone many incarnations since its first formulation. Therefore, the findings of studies conducted on pill use through the years cannot necessarily be compared directly, and often conflict. Moreover, the other risk factors that play important roles in the development of breast cancer in certain women may or may not interact with oral contraceptive use to further complicate the risk profile.

With the publication of each new study, the picture has become more, rather than less, complicated, and physicians have found the task of balancing the potential benefits and risks of oral contraceptives for individual patients—many of whom fear that the pill may cause cancer—increasingly difficult. Nancy Lee, deputy chief of the Women's Health and Fertility Branch for the Division of Reproductive Health at the CDC, provided the attendees at the Atlanta meeting with an overview of more than 20 case-control studies. She pointed out that the relative risk among ever-users in these studies has consistently hovered around 1.0, regardless of the woman's age or the duration of use, and that there have been only three cohort studies of sufficient size to examine the relationship between breast cancer and oral contraceptives, none of which found an increased risk for ever-users, compared to never-users.

However, recent studies have raised concerns about the effect of oral contraceptive use on the developing breast, especially the effects of long-term use, use at young ages and use before a first term pregnancy. In addition, the results of epidemiological studies have suggested that oral contraceptive use may increase the risk of breast cancer in relatively young women. Although the risks for ever-users under 45 have generally been elevated, only one study has found a statistically significant increase in risk for this group: Ever-users aged 30–34 and 35–39 had significantly increased relative risks of 3.2 and 2.6, respectively, compared with never-users.[5]

To highlight the reasons for the controversy over the effects of oral contraceptives on the risk of breast cancer, Lee reviewed selected results from five recent studies. In the Cancer and Steroid Hormone (CASH) study, women who had used the pill for more than 15 years had a reduced risk of 0.6, which suggests that long-term use of oral contraceptives has a protective effect.[6] However, this finding was not supported by a consistent pattern of decreasing risk with increasing duration of use. Among women younger than

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45, the risk for ever-users was slightly elevated for all durations of use, in comparison with the risk for never-users. However, like the risk for ever-users overall, there was no evidence of increasing risk with increasing years of use. Taken on their own, Lee said, these results do not support the belief that younger users are at higher risk. When the results were stratified by five-year age-group, only two groups—20–24-year-olds and 30–34-year-olds—had an elevated risk, and neither risk was statistically significant. There was no consistent pattern of rising or falling risk with increasing age (1.0 for 25–29-year-olds; 1.3 for 30–34-year-olds; 0.8 for 50–54-year-olds); therefore, Lee said, she did not find the evidence of higher risk among 20–24-year-olds and 30–34-year-olds convincing.

A 1986 New Zealand study of 25–54-year-old women found a nonsignificant doubling of breast cancer risk (2.2) among ever-users aged 25–34, compared with an overall risk of 0.9.[7] There was no indication of an increased risk among women older than 35. When the sample was broken down by age-group, women aged 25–34 who had taken the pill for 10 or more years had an increased risk of 4.6; however, that risk estimate was based on only eight cases and 17 controls and was not statistically significant.

In Sweden and Norway, a population-based case-control study limited to women younger than 45 found no significantly elevated risk for women who had used the pill for less than 12 years; however, women who had taken oral contraceptives for 12 years or more were twice as likely as never-users to have breast cancer, a statistically significant increase.[8] (The same pattern was found when the Swedish cases younger than 40 were compared to their controls, but that increase was not significant.) Logistic regression analysis revealed a similarly elevated, significant risk associated with total duration of use, both for the sample as a whole and for ever-users younger than 40.

Like the Scandinavian study, a 1989 British case-control study of women diagnosed with breast cancer before age 36 found a statistically significant increase in risk with increased duration of use (risks of 1.4 for 49–96 months and 1.7 for 97 months or more).[9] On the other hand, a recent analysis of data from the Nurses' Cohort Study found no statistically significant increase in risk with increased duration of use, even among the women who had used the pill for the longest periods of time.[10] The analysis also found no evidence of a protective effect from oral contraceptive use.

Why the disparity in findings? According to Lee, many of the relative risks found in these studies are in the 1.0–2.0 range, not of particularly strong magnitude; moreover, a weak association found for a subgroup is difficult to interpret when the overall relative risk for a sample is 1.0. Second, the studies selected controls in different ways, such as random dialing or random selection from voter registration rolls. Third, a weak association may be produced merely by chance. Fourth, disparities may result from differences in the populations studied; for example, women in different countries may metabolize steroids in different ways. Last, patterns of oral contraceptive use (e.g., the age at which use begins) may vary in different populations.

New CASH Analysis

Phyllis Wingo, chief of the Statistics Section of the Division of Reproductive Health at the CDC, presented findings from a new analysis of the CASH data that support by analogy the hypothesis that the risk of breast cancer related to oral contraceptive use may vary with age. Certain risk factors, she said, including parity, marital status, age at menarche, race and birthplace, interact with age to have the opposite effect of what might be expected. For example, parous women of all ages have a decreased risk of breast cancer compared to nulliparous women, and the risk among high-parity women is lower than that among low-parity women. However, high-parity women younger than 35 have an increased risk of breast cancer compared to low-parity women in the same age-group. Yet because the incidence of breast cancer among women younger than 35 is low, and because most reports describe the parity effect over all ages, parity is generally considered protective against breast cancer.

The new analysis divided the study sample into three groups based on age at diagnosis (for breast cancer patients) or at interview (for controls): 20–34, 35–44 and 45–54. Women aged 20–34 were about twice as likely as those aged 45–54 to have used oral contraceptives (89 percent vs. 44–48 percent). The mean age at first use was 20 among the youngest women, 24 in the middle age-group and 32 among the oldest women. Among the parous women, 50 percent of the youngest group had used the pill before their first term pregnancy, compared to only three percent of the oldest women. Compared to never-users in their age-group, the youngest users (aged 20–34) had a slightly elevated relative risk of 1.4, while the oldest had a slightly decreased relative risk of 0.9; both findings were of borderline significance. No relationship was found between duration of use and relative risk for any age-group.

When the researchers looked at duration of time since first use of oral contraceptives, they found generally increased risks among the youngest women and generally decreased risks among the oldest women. They also found a statistically significant trend among the oldest women of decreasing risk with increasing time since first use. Women who had first used the pill more than 20 years before diagnosis or interview had a significantly decreased risk (0.6). Among the oldest group only, there was a trend of decreasing risk with increasing time since last use of oral contraceptives. Risk also diminished significantly with decreasing age at first use among the oldest women; this protective effect was most pronounced when use began before age 25.

Compared with never-users, both parous and nulliparous ever-users younger than 45 were at slightly elevated relative risk of breast cancer. Therefore, regardless of parity, duration of use or timing of use with respect to first term birth, oral contraceptive users younger than 45 were at slightly higher risk than never-users in the same age-group.

The investigators concluded that oral contraceptive use affects the relative risk of breast cancer differently for women of different ages at diagnosis: It appears to increase the relative risk of breast cancer slightly among women aged 20–34 at diagnosis and decrease the risk slightly among women aged 45–54.

Wingo cautioned that although this was a very large study with considerable statistical power, interpreting findings that show small increases or decreases in risk is difficult. She added that nine other studies analyzing risk by age-group had included women over 45. Of these, three found slight variations in risk by age: Two found slightly increased risks for younger women and all three found slightly decreased risks for women 45 and older. The other six studies found no age-specific effects. Wingo said that she considered the finding of slightly reduced risk among ever-users aged 45–54 more convincing than the result of slightly elevated risk among women younger than 35 because of dose-response effects found among the 45–54-year-olds.

James Schlesselman of the Uniformed

Services University of the Health Sciences, who provided the IOM committee with an overview of relevant studies to date, speculated that the use of oral contraceptives may induce the earlier development of breast cancer in someone who is already prone to the disease. However, he cautioned that no certain conclusions could be drawn, since not all of the data agree and since only one in 100 women develop breast cancer before age 45. Schlesselman also pointed out that while individual studies may not carry enormous weight on their own, the impact of several major studies reaching similar conclusions is far greater. He noted that when the results of relevant studies are averaged, women under 45 years of age who have used oral contraceptives for a long period of time (more than 8 to 10 years) may have an increased relative risk of 1.42 (confidence interval, 1.25–1.63) or approximately 40 percent. Use of the pill for 14–15 years, if begun at an early age, may increase the risk of breast cancer by as much as 70 percent, but women often stop using the pill for varying periods of time, and no studies to date have examined whether significant breaks in pill use affect the relative risks of breast cancer.

Data are sketchy, contradictory or altogether nonexistent regarding a number of variables, such as the effects of the pill on ethnic groups other than blacks and whites and on the different levels of estrogens and progestagens within pills. Further complicating the interpretation of available data is the fact that reproductive health patterns in the United States have changed since the inception of many of the longer term studies. For example, women who have used oral contraceptives may be getting more frequent mammograms—and at earlier ages—than their counterparts 15 years ago, which results in better and earlier detection of cancerous lumps but also in a potential "detection bias." In addition, long-term pill users often report more consistent breast self-examinations than short-term users, possibly because they are older or more aware of potential side effects. Thus, there may be differences between various groups of oral contraceptive users that are not always readily taken into account when study results are compiled.

Biological Considerations

No clear-cut biological explanation for breast cancer exists, and so far there have been only modest explorations of the hormonal factors that might contribute to its development, attendees at the IOM conference were told. The complex cycles of hormone production during the various stages of a woman's reproductive life span are now being more closely examined by reproductive biologists. Breast tissue undergoes natural growth and regression cycles during a menstrual period, but researchers need to know far more about this basic physiology of the human breast before they can determine whether estrogens (which act to prepare cells for division) or progestins (which facilitate cell division) are key factors in the early proliferation of malignant tissue. A related question is whether the synthetic hormones contained in oral contraceptives affect the breast differently than their naturally occurring counterparts, even though the level of estrogen contained in current pills is less than that produced in a woman's normal menstrual cycle. In addition, each woman is different biologically, and her ability to fully absorb the estrogens provided in oral contraceptives may differ as well.

For years, scientists have searched for biological "markers" that may serve as warning signs of an increased risk of breast cancer. One kind of marker may be the ratio of the various types of estrogens. Although all estrogens appear to have their place in the normal functioning of the reproductive cycle, some are believed to increase the development of certain fatty tissues in the breast that may leave women prone to cancerous tumors, while others are not. Thus, activities or products that increase the "good" estrogens may serve as protection against breast cancer, and those that increase the production of other types of estrogens may be a signal that breast cancer could develop. Such a correlation has been shown in mice.[11] Scientists note that smoking, maintaining a thin build, exercising and eating cruciferous vegetables seem to be associated with the production of good estrogens, while obesity and a family history of breast cancer seem to be associated with the production of estrogens that may contribute to tumor formation.

Animal studies can be instructive in pointing the way towards possible avenues in human research. The largest studies evaluating the carcinogenicity of contraceptive sterioids have been on mice and rats and, to a lesser extent, on beagle dogs. Animal research performed since the 1950s has shown that potentially carcinogenic effects of estrogens can be modified by the addition of progestins. However, human reproductive systems are not identical to those of animals, and many questions remain as to whether different ratios of estrogens to progestins might alter the rates of breast cancer in humans.

Options and Implications

It is well established that oral contraceptive use is not without risks, yet for many women the prevention of unintended pregnancy confers a benefit that outweighs those risks. However, should an increased risk of breast cancer be linked to pill use among some groups of women, they may be sufficiently concerned to switch to other methods of contraception.

The need for further research on identifiable subgroups of women, as well as country-specific studies, was stressed by several presenters at the IOM conference, although the danger of focusing only on the highest risk subgroups was also acknowledged. The balance of risks and benefits will be different for different women, especially in developing countries, where maternal mortality rates are high. In addition to the prevention of unintended pregnancy, known benefits conferred by oral contraceptive use are protection against ovarian and endometrial cancers, regulation of menstrual problems, alleviation of iron deficiency and prevention of benign breast disease and pelvic inflammatory disease. Known risks, primarily demonstrated by studies conducted in the 1970s, include myocardial infarction, stroke and venous thromboembolism.

Breast cancer remains an unknown quantity in this equation. In extrapolating from two groups of women aged 16–35, one of which used the condom and the other of which used the pill, David Skegg of the University of Otago, New Zealand, cited data from the United Kingdom indicating that the pill prevents 1,134–1,240 deaths due to its protective effects against ovarian cancer.[12] However, if breast and cervical cancer incidence up to age 35 are factored in, 1,075 more deaths would occur, thus canceling out any beneficial effect. Theoretically, if the rate of breast cancer is the same rate up to the age of 50, another 4,157 deaths would result. He noted that the length of use appears to be positively associated with the incidence of breast cancer; use for more than eight years yielded a relative risk of 1.74, according to data from a British study conducted in 1989.[13] Overall, Skegg noted, oral contraceptive use appears to result in a modest increase in the risk of breast cancer up to age 35, no material increase in risk after age 45 and, possibly, a decline in risk between ages 35 and 44. However, it remains unclear whether a specific association can be demonstrated between breast cancer risk and oral contraceptive use at a young age, whether recent use can be compared with the effect of a recent pregnancy and whether use of lower dose pill formulations obviate any of these risks.[14]

In attempting to design a model that could help predict the risks and the benefits of oral contraceptive use among various subgroups of women, the IOM committee considered such related factors as age at first use, duration of use, relationship to first pregnancy, relative risk of mortality, recency of use, duration of protective or harmful effects, smoking, and ratio of estrogen to progestin.* Although quality of life issues and factors relating to morbidity—as opposed to counting only the numbers of deaths averted—are far more difficult to quantify, identifying these parameters may be critical to obtaining a truly balanced picture. Moreover, for some groups of women, particularly teenagers or women in developing countries, the relatively low mortality risk from pill use may be merely an abstract concern compared with the prevention of an unintended pregnancy. For other women, even a slightly increased risk of breast cancer associated with pill use may present a strong deterrent.

The conferees also discussed innovative epidemiological approaches for testing hypotheses on oral contraceptive use. For example, reproductive biologists would like to find ways to determine whether breast cancer strikes a particular subset of women who are already genetically or environmentally susceptible and who happen to be using the pill, whether oral contraceptives act as agents to promote the disease, or whether some combination of these factors is involved. While some groups of women who use the pill may be considered at especially high risk for developing breast cancer, epidemiologists noted that women who have never used oral contraceptives might not be the best comparison group to use in studies of these factors.

Some of these approaches, as well as new biological techniques, will be incorporated in a large case-control study initiated in June 1990 under the auspices of the National Cancer Institute (NCI). The study, which focuses on the rate and characteristics of oral contraceptive users who develop breast cancer up to the age of 55, is being conducted through face-to-face interviews in Seattle, Atlanta and New Jersey. While media coverage of the possible link between pill use and breast cancer may introduce some recall bias into the results, investigators will attempt to validate the responses by checking physician records and obtaining detailed family histories. A concerted attempt will also be made to identify biochemical markers for breast cancer, although people are usually less willing to supply blood and urine samples than to supply information. In addition, the NCI is supporting several case-control and cohort studies designed to examine the effects of the pill on normal breast physiology. However, the results of these studies will not be known for some time.

There appeared to be little doubt in the minds of the IOM conference participants that far more research on the relationship of the pill and breast cancer is needed at nearly every level. Neither current information nor the data that will be obtained from the studies just getting underway will begin to answer all of the questions about the long-term effects of oral contraceptives on breast cancer risk. The IOM is expected to submit a report to the NICHD in late 1990 that will summarize the current state of knowledge and make specific recommendations regarding further biological and epidemiological research needs. Because modern lifestyles have meant an unprecedented dependence on contraceptives, participants agreed that the most current information must continue to be disseminated to the public to allow individuals to make educated decisions within the context of their lives and their need to prevent unintended pregnancy.

The consensus of the Atlanta panel members was that no change in prescribing practice is indicated at this time. Nevertheless, they recommended continuing medical surveillance of women who begin using the pill at a young age and continue use for a number of years. In the absence of convincing evidence that oral contraceptives increase the risk of breast cancer, the panel members generally took the view that recommendations about pill use should be based on careful consideration of the potential risks and benefits to each individual.

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*To date, however, no large case-control study has compared the risk of breast cancer associated with oral contraceptives containing high doses of estrogen to that of oral contraceptives containing the lower doses predominantly used today. Thus, it is unclear what the association between the risk of breast cancer and the estrogen-progestin ratio might be—or even if there is one.

Documents

The Supreme Court Upholds Parental Notice Requirements

The U.S. Supreme Court ruled on June 25, 1990, in two cases challenging the constitutionality of state laws that require parents to be notified when their minor daughter is planning to have an abortion. In *Hodgson* v. *Minnesota*, the Court held that while states may not impose a blanket two-parent notification requirement on minors seeking abortions, they may demand that both biological parents be notified so long as a judicial bypass is provided for minors who do not want to inform their parents about their plans. In *Ohio* v. *Akron Center for Reproductive Health*, the Court upheld a one-parent notification statute that included a judicial bypass, although it expressly refused to decide whether a state *must* provide a bypass option if it mandates notice to only one parent.

The *Hodgson* case involved a challenge to two sections of a Minnesota statute. One section, subdivision 2, imposed a flat two-parent notice requirement, with exceptions only in cases of emergency, inability to locate one parent, or sexual, physical or emotional abuse of the minor by one parent (which must be reported to law enforcement authorities). By a 5–4 margin, the Court held that the blanket requirement did not serve any legitimate state interest, with Justice John Paul Stevens writing that "the state has no more interest in requiring all family members to talk with one another than it has in requiring certain of them to live together." Justices William Brennan, Harry Blackmun, Thurgood Marshall and Sandra Day O'Connor joined Justice Stevens in striking down the two-parent notice requirement.

A different 5–4 majority, however, upheld subdivision 6 of the law, which required two-parent notification but permitted minors who did not want to inform their parents to obtain court authorization for the abortion. Justice Anthony Kennedy concluded that with the bypass, subdivision 6 was consistent with previous Court decisions on parental involvement laws, and Chief Justice William Rehnquist and Justices Antonin Scalia, Byron White and O'Connor agreed with Kennedy.

In addition, by a vote of 6–3, the Court held in *Hodgson* that states may require minors to wait 48 hours between when the parents are notified and when the abortion is performed. The Court reasoned that the waiting period gives parents an opportunity to inform the doctor of their daughter's medical history and to investigate the physician's competence.

In the *Ohio* decision, the Court considered the constitutionality of various procedural provisions of the law's judicial bypass procedure, ruling that states do not have to guarantee a minor absolute anonymity so long as they take reasonable steps to ensure that her name does not become public. The Court also ruled that states can require a minor to prove to a judge by "clear and compelling" evidence—the most difficult legal standard of proof—that she is sufficiently mature to consent to abortion on her own or that parental notice is not in her best interest. In addition, the Court held that states may require that the doctor who is to perform the abortion notify the minor's parent personally.

Excerpts from the justices' written opinions are reprinted here.

Hodgson Opinion by Stevens

The parental notice statute . . .[1] qualified the authority of an "unemancipated minor" to give effective consent to an abortion by requiring that either her physician or an agent notify "the parent" personally or by certified mail at least 48 hours before the procedure is performed [subdivision 2]. The term "parent" is defined in subdivision 3 to mean "both parents of the pregnant woman if they are both living." No exception is made for a divorced parent, a noncustodial parent or a biological parent who has never married or lived with the pregnant woman's mother. The statute does provide, however, that if only one parent is living, or "if the second one cannot be located through reasonably diligent effort," notice to one parent is sufficient. It also makes exceptions for cases in which emergency treatment prior to notice "is necessary to prevent the woman's death," [in which] both parents have already given their consent in writing or [in which] the proper authorities are advised that the minor is a victim of sexual or physical abuse. . . .

Subdivision 6 authorizes a judicial bypass of the two-parent notice requirement if subdivision 2 is ever "temporarily or permanently" enjoined by judicial order. If the pregnant minor can convince "any judge of a court of competent jurisdiction" that she is "mature and capable of giving informed consent to the proposed abortion," or that an abortion without notice to both parents would be in her best interest, the court can authorize the physician to proceed without notice. . . .

[This] Court has considered the constitutionality of statutes providing for parental consent or parental notification in six abortion cases decided during the last 14 years.[2] Although the Massachusetts statutes reviewed in *[Bellotti I]* and *Bellotti II* required the consent of both parents, and the Utah statute reviewed in *H. L.* v. *Matheson* . . . required notice to "the parents," none of the opinions in any of those cases focused on the possible significance of making the consent or the notice requirement applicable to both parents instead of just one. . . .

We think it is clear that a requirement that a minor wait 48 hours after notifying a single parent of her intention to get an abortion would reasonably further the legitimate state interest in ensuring that the minor's decision is knowing and intelligent. . . . The brief waiting period provides the parent the opportunity to consult with his or her spouse and a family physician, and it permits the parent to inquire into the competency of the doctor performing the abortion, discuss the religious or moral implications of the abortion decision, and provide the daughter needed guidance and counsel in evaluating the impact of the decision on her future....

The 48-hour delay imposes only a minimal burden on the right of the minor to decide whether or not to terminate her pregnancy. Although the District Court found that scheduling factors, weather and the minor's school and work commitments may combine, in many cases, to create a delay of a week or longer between the initiation of notification and the abortion, there is no evidence that the 48-hour period itself is unreasonable or longer than appropriate for adequate consultation between parent and child.... Indeed, as the Court of Appeals noted and the record reveals, the 48-hour waiting period may run concurrently with the time necessary to make an appointment for the procedure, thus resulting in little or no delay.

It is equally clear that the requirement that *both* parents be notified, whether or not both wish to be notified or have assumed responsibility for the upbringing of the child, does not reasonably further any legitimate state interest. The usual justification for a parental consent or notification provision is that it supports the authority of a parent who is presumed to act in the minor's best interest and thereby assures that the minor's decision to terminate her pregnancy is knowing, intelligent and deliberate. To the extent that such an interest is legitimate, it would be fully served by a requirement that the minor notify one parent who can then seek the counsel of his or her mate or any other party, when such advice and support is deemed necessary to help the child make a difficult decision. In the ideal family setting, of course, notice to either parent would normally constitute notice to both. A statute requiring two-parent notification would not further any State interest in those instances. In many families, however, the parent notified by the child would not notify the other parent. In those cases the state has no legitimate interest in questioning one parent's judgment that notice to the other parent would not assist the minor or in presuming that the parent who has assumed parental duties is incompetent to make decisions regarding the health and welfare of the child.

Not only does two-parent notification fail to serve any State interest with respect to functioning families, it disserves the state interest in protecting and assisting the minor with respect to dysfunctional families. The record reveals that in the thousands of dysfunctional families affected by this statute, the two-parent notice requirement proved positively harmful to the minor and her family....

Unsurprisingly, the Minnesota two-parent notification requirement is an oddity among state and federal consent provisions governing the health, welfare and education of children. A minor desiring to enlist in the armed services... need only obtain the consent of "his parent or guardian."... The consent of "*a* parent or guardian" is also sufficient to obtain a passport for foreign travel from the United States Department of State.... In virtually every State, the consent of one parent is enough to obtain a driver's license or operator's permit. The same may be said with respect to the decision to submit to any medical or surgical procedure other than abortion. Indeed, the only other Minnesota statute that the State has identified which requires two-parent consent is that authorizing the minor to change his name.... These [examples] provide testimony to the unreasonableness of the Minnesota two-parent notification requirement and the ease with which the State can adopt less burdensome means to protect the minor's welfare....

The Court holds that the constitutional objection to the two-parent notice requirement is removed by the judicial bypass option provided in subdivision 6 of the Minnesota statute. I respectfully dissent from that holding....

...A requirement that a minor acting with the consent of *both* parents apply to a court for permission to effectuate her decision clearly would constitute an unjustified official interference with the privacy of the minor and her family. The requirement that the bypass procedure must be invoked when the minor and one parent agree that the other parent should not be notified represents an equally unjustified governmental intrusion into the family's decisional process....

Kennedy, Joined by Rehnquist, White And Scalia, Concurs in Part

...I dissent from the portion of the Court's judgment affirming the Court of Appeal's conclusion that Minnesota's two-parent notice statute is unconstitutional.

A State pursues a legitimate end under the Constitution when it attempts to foster and preserve the parent-child relation by giving all parents the opportunity to participate in the care and nurture of their children.... We have recognized, of course, that there are limits to the constitutional right of parents to have custody of or to participate in decisions affecting their children. If a parent has relinquished the opportunity to develop a relation with the child, and his or her only link to the child is biological, the Constitution does not require a State to allow parental participation.... But the fact that the Constitution does not protect the parent-child relationship in all circumstances does not mean that the state cannot attempt to foster parental participation where the Constitution does not demand that it do so. A State may seek to protect and facilitate the parent-child bond on the assumption that parents will act in their child's best interests....

The Court's descriptions of the State's interests in this case are caricatures, both of the law and of our most revered institutions. The Court labels these interests as ones in "standardizing its children and adults" and in ensuring that each family, to the extent possible, "conform to some state-designed ideal."... Minnesota asserts no such purpose, by explicit statement or by any permissible inference. All that Minnesota asserts is an interest in seeing that parents know about a vital decision facing their child....

...[I]t does remain possible, of course, that in some instances notifying one or both parents will not be in the minor's best interests.... [However, a] law is not invalid if it fails to further the governmental interest in every instance....

...Assuming, as I am bound to do for this part of the analysis, that the notice provisions standing alone are invalid, I conclude that the two-parent notice requirement with the judicial bypass alternative is constitutional....

In providing for the bypass, Minnesota has done nothing other than attempt to fit its legislation into the framework that we have supplied in our previous cases. The simple fact is that our decision in *Bellotti II* stands for the proposition that a two-parent consent law is constitutional if it provides for a sufficient judicial bypass alternative, and it requires us to sustain the statute before us here....

In this case, the Court rejects a legislature's judgment that parents should at least be aware of their daughter's intention to seek an abortion.... That judgment is rejected although it rests upon a tradition of a parental role in the care and upbringing of children that is as old as civilization itself. Our precedents do not permit this result.

It is true that for all too many young women the prospect of two parents, perhaps even one parent, sustaining her with support that is compassionate and committed is an illusion. . . . But the Court errs in serious degree when it commands its own solution to the cruel consequences of individual misconduct, parental failure and social ills. The legislative authority is entitled to attempt to meet these wrongs by taking reasonable measures to recognize and promote the primacy of the family tie, a concept this Court now seems intent on declaring a constitutional irrelevance.

O'Connor Concurs

. . . I agree with Justice Stevens that Minnesota has offered no sufficient justification for its interference with the family's decisionmaking processes created by subdivision 2—two-parent notification. . . .

Minnesota's two-parent notice requirement is all the more unreasonable when one considers that only half of the minors in the State of Minnesota reside with both biological parents . . . A third live with only one parent. . . .

[However,] Subdivision 6 passes constitutional muster because the interference with the internal operation of the family required by subdivision 2 simply does not exist where the minor can avoid notifying one or both parents by use of the bypass procedure.

Marshall, Joined by Brennan and Blackmun, Concurs in Part

. . . For the reasons stated by Justice Stevens . . . Minnesota's two-parent notification requirement is not even reasonably related to a legitimate state interest. . . .

I dissent from the judgment of the Court, however, that the judicial bypass option renders the parental notification and 48-hour delay requirement constitutional. . . . At the very least, this scheme substantially burdens a woman's right to privacy without advancing a compelling state interest. . . .

This Court has consistently held since *Roe* v. *Wade* . . . that the constitutional right of privacy "is broad enough to encompass a woman's decision whether or not to terminate her pregnancy."[3] We have also repeatedly stated that "[a] woman's right to make that choice freely is fundamental."[4] . . .

Roe remains the law of the land. . . . Indeed, today's decision reaffirms the vitality of *Roe*, as five Justices have voted to strike down a state law restricting a woman's right to have an abortion. . . .

The State . . . claims that the statute serves the interest of protecting parents' independent right "to shape the[ir] child[ren]'s values and life style[s]" and "to determine and strive for what they believe to be best for their children."[5] If this is so, the statute is surely underinclusive, as it does not require parental notification where the minor seeks medical treatment for pregnancy, venereal disease or alcohol or other drug abuse. . . . Are we to believe that Minnesota parents have no interest in their children's well-being in these other contexts? . . .

I continue to believe . . . that a judicial bypass procedure . . . is itself unconstitutional because it effectively gives a judge "an absolute veto over the decision of the physician and his patient."[6] . . . No person may veto *any* minor's decision, made in consultation with her physician, to terminate her pregnancy. . . .

. . . Is the judge expected to know more about the woman's medical needs or psychological makeup than her doctor? Should he consider the woman's financial and emotional status to determine the quality of life the woman and her future child would enjoy in this world? . . . It is difficult to conceive of any reason, aside from a judge's personal opposition to abortion, that would justify a finding that an immature woman's best interests would be served by forcing her to endure pregnancy and childbirth against her will. . . .

A majority of the Court today strikes down an unreasonable and vastly overbroad requirement that a pregnant minor notify both her parents of her decision to obtain an abortion. With that decision I agree. At the same time, though, a different majority holds that a State may require a young woman to notify one or even both parents and then wait 48 hours before having an abortion, as long as the State provides a judicial bypass procedure. From that decision I vehemently dissent. . . .

Scalia Concurs in Part

As I understand the various opinions today: One Justice holds that two-parent notification is unconstitutional (at least in the present circumstances) without judicial bypass, but constitutional with bypass . . . ; four Justices would hold that two-parent notification is constitutional with or without bypass . . . ; four Justices would hold that two-parent notification is unconstitutional with or without bypass, though the four apply two different standards . . . ; six Justices hold that one-parent notification with bypass is constitutional, though for two different sets of reasons . . . ; and three Justices would hold that one-parent notification with bypass is unconstitutional. . . . One will search in vain the document we are supposed to be construing for text that provides the basis for the argument over these distinctions; and will find in our society's tradition regarding abortion no hint that the distinctions are constitutionally relevant, much less any indication how a constitutional argument about them ought to be resolved. The random and unpredictable results of our consequently unchanneled individual views make it increasingly evident, Term after Term, that the tools for this job are not to be found in the lawyer's—and hence not in the judge's—workbox. I continue to dissent from this enterprise of devising an Abortion Code, and from the illusion that we have the authority to do so.

Ohio Majority Opinion by Kennedy

The Ohio Legislature, in November 1985, enacted Amended Substitute House Bill 319 (H.B. 319). . . . Section 2912.12(B), the cornerstone of this legislation, makes it a criminal offense, except in four specified circumstances, for a physician or other person to perform an abortion on an unmarried and unemancipated woman under 18 years of age. . . .

The first and second circumstances in which a physician may perform an abortion relate to parental notice and consent. First, a physician may perform an abortion if he provides "at least 24 hours actual notice, in person or by telephone," to one of the woman's parents (or her guardian or custodian) of his intention. . . . The physician, as an alternative, may notify a minor's adult brother, sister, stepparent or grandparent, if the minor and the other relative each file an affidavit in the juvenile court stating that the minor fears physical, sexual or severe emotional abuse from one of her parents. . . . If the physician cannot give the notice "after a reasonable effort," he may perform the abortion after "at least 48 hours constructive notice" by both ordinary and certified mail. . . . Second, a physician may perform an abortion on the minor if one of her parents . . . has consented to the abortion in writing. . . .

The third and fourth circumstances depend on a judicial procedure that allows a minor to bypass the notice and consent provisions. . . . The statute allows a physician to perform an abortion without notifying one of the minor's parents or receiving the parent's consent if a juvenile court issues an order authorizing the minor to consent . . . or if a juvenile court or court of appeals, by its inaction, provides constructive authorization for the minor to consent....

This dispute turns, to a large extent, on the adequacy of H.B. 319's judicial bypass procedure. In analyzing this aspect of the dispute, we note that, although our cases have required bypass procedures for parental consent statutes, we have not decided whether parental notice statutes must contain such procedures.... We leave the question open, because, whether or not the Fourteenth Amendment requires notice statutes to contain bypass procedures, H.B. 319's bypass procedure meets the requirement identified for parental consent statutes in *Danforth, Bellotti, Ashcroft* and *Akron*[7]....

Appellees* argue that the complaint forms prescribed by the Ohio Supreme Court will require the minor to disclose her identity. Unless the minor has counsel, she must sign a complaint form to initiate the bypass procedure and, even if she has counsel, she must supply the names of her parents at four different places....

...[W]e do not find complete anonymity critical. H.B. 319... takes reasonable steps to prevent the public from learning of the minor's identity. We refuse to base a decision on the facial validity of a statute on the mere possibility of unauthorized, illegal disclosure by state employees....

The District Court and the Court of Appeals... calculated... that the [bypass] procedure could take up to 22 calendar days [to complete if an appeal was needed, and appellees] maintain... that a three-week delay could increase by a substantial measure both the costs and the medical risks of an abortion....

...[However,] under our precedents, the mere possibility that the procedure may require up to 22 days in a rare case is plainly insufficient to invalidate the statute on its face....

...[A]ppellees ask us to rule that a bypass procedure cannot require a minor to prove maturity or best interests by a standard of clear and convincing evidence. They maintain that, when a State seeks to deprive an individual of liberty interests it must take upon itself the risk of error.... House Bill 319 violates this standard, in their opinion, not only by placing the burden of proof upon the minor, but also by imposing a heightened standard of proof.

This contention lacks merit. A State does not have to bear the burden of proof on the issues of maturity or best interests.... A State, moreover, may require a heightened standard of proof when, as here, the bypass procedure contemplates an *ex parte* proceeding at which no one opposes the minor's testimony....

...[A]ppellees [also] contend that the pleading requirements in H.B. 319 create a trap for the unwary. The minor... must chose among three pleading forms.... The first alleges only maturity and the second alleges only best interests. She may not attempt to prove both maturity and best interests unless she chooses the third form, which alleges both of these facts. Appellees contend that the complications imposed by this scheme deny a minor the opportunity... to prove either maturity or bests interests or both....

Even on the assumption that the pleading scheme could produce some initial confusion because few minors would have counsel when pleading, the simple and straightforward procedure does not deprive the minor of an opportunity to prove her case. It seems unlikely that the Ohio courts will treat a minor's choice of complaint form without due care and understanding for her unrepresented status. In addition, we note that the minor does not make a binding election by the initial choice of pleading form. The minor... receives appointed counsel after filing the complaint and may move for leave to amend the pleadings.... Regardless of whether Ohio could have written a simpler statute, H.B. 319 survives a facial challenge.

...Appellees maintain... that Ohio has no reason for requiring the minor's physician, rather than some other qualified person, to notify one of the minor's parents.

Appellees, however, have failed to consider our precedent on this matter.... We continue to believe that a State may require the physician himself or herself to take reasonable steps to notify a minor's parent because the parent often will provide important medical data to the physician.... The conversation with the physician, in addition, may enable a parent to provide better advice to the minor....

Any imposition on a physician's schedule, by requiring him to give notice when the minor does not have consent from one of her parents or court authorization, must be evaluated in light of the complete statutory scheme. The statute allows the physician to send notice by mail if he cannot reach the minor's parent "after a reasonable effort"... and allows him to forgo notice in the event of certain emergencies....

The Ohio statute, in sum, does not impose an undue, or otherwise unconstitutional, burden on a minor seeking an abortion. We believe... that the legislature acted in a rational manner in enacting H. B. 319. A free and enlightened society may decide that each of its members should attain a clearer, more tolerant understanding of the profound philosophic choices confronted by a woman who is considering whether to seek an abortion. Her decision will embrace her own destiny and personal dignity, and the origins of the other human life that lie within the embryo. The State is entitled to assume that, for most of its people, the beginnings of that understanding will be within the family, society's most intimate association. It is both rational and fair for the State to conclude that, in most instances, the family will strive to give a lonely or even terrified minor advice that is both compassionate and mature. The statute in issue here is a rational way to further these ends....

Stevens Concurs

...The question in this case is whether the statutory protection for the exceptional case is so obviously inadequate that the entire statute should be invalidated. I am not willing to reach that conclusion before the statute has been implemented and the significance of its restrictions evaluated in the light of its administration....

The Court correctly states that we have not decided the specific question of whether a judicial bypass procedure is necessary in order to save the constitutionality of a single [parental] notice statute.... We have, however, squarely held that a requirement of preabortion parental notice in all cases involving pregnant minors is unconstitutional. Although it need not take the form of a judicial bypass, the State must provide an adequate mechanism for cases in which the minor is mature or notice would not be in her best interests....

There is some tension between the statutory requirement that the treating physician notify the minor's parent and our decision in *Akron*[8]... that a State may not require the attending physician to personally counsel an abortion patient. One cannot overlook the possibility that this provision was motivated more by a legislative interest in placing obstacles in the woman's path to an abortion... than by a genuine interest in fostering informed decisionmaking. I agree with the Court, however, that the Ohio statute requires only that the physician take "reasonable steps" to notify a minor's parent and that such notification may contribute to the decisionmaking process. . . .

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*The constitutionality of the Ohio law was challenged by the Akron Center for Reproductive Health, by a physician who performs abortions at the center and by a minor who sought an abortion at the facility. They are the appellees.

Blackmun, Joined by Brennan and Marshall, Dissents

. . . The State of Ohio has acted with particular insensitivity in enacting the statute the Court today upholds. Rather than create a judicial-bypass system that reflects the sensitivity necessary when dealing with a minor making this deeply intimate decision, Ohio has created a tortuous maze. Moreover, the State has failed utterly to show that it has any significant state interest in deliberately placing its pattern of obstacles in the path of the pregnant minor seeking to exercise her constitutional right to terminate a pregnancy. . . .

The majority does not decide whether the Ohio parental notice statute must contain a judicial bypass procedure because the majority concludes the bypass procedure in the statute "meets the requirements identified for parental-consent statutes. . . ." I conclude, however, that because of the minor's emotional vulnerability and financial dependency on her parents, and because of the "unique nature of the abortion decision," . . . a parental notice statute is tantamount to a parental consent statute. As a practical matter, a notification requirement will have the same deterrent effect on a pregnant minor . . . as does a consent statute. . . .

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2. Planned Parenthood of Central Missouri v. Danforth, 428 U.S. 52 (1976); Bellotti v. Baird, 428 U.S. 132 (1976) (Bellotti I); Bellotti II, 443 U.S. 662 (1979); H. L. v. Matheson, 450 U.S. 398 (1981); Akron v. Akron Center for Reproductive Health, Inc., 462 U.S. 416 (1983); and Planned Parenthood Association of Kansas City, Mo., Inc. v. Ashcroft, 462 U.S. 476 (1983).

3. Roe v. Wade, 410 U.S. 113 (1973).

4. Ibid.; Akron v. Akron Center for Reproductive Health, Inc., 462 U.S. 416 (1983); and Thornburgh v. American College of Obstetricians and Gynecologists, 476 U.S. 747 (1986).

5. Brief for Petitioners in No. 88–1309, p. 26.

6. Planned Parenthood Association of Kansas City, Mo., Inc. v. Ashcroft, 462 U.S. 476 (1983).

7. Planned Parenthood of Central Missouri v. Danforth, 428 U.S. 52 (1976); Bellotti v. Baird, 428 U.S. 132 (1976); Planned Parenthood Association of Kansas City, Mo., Inc. v. Ashcroft, 462 U.S. 476 (1983); and Akron v. Akron Center for Reproductive Health, Inc., 462 U.S. 416 (1983).

8. Akron v. Akron Center for Reproductive Health, Inc., 462 U.S. 416 (1983).

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Editorial

The Supreme Court Retreats Another Step on Abortion

By Jeannie I. Rosoff

"Ambiguous," "contradictory" and "murky" are among the words that have been used to characterize the Supreme Court decisions in late June regarding minors' access to legal abortion. The Court's complex decisions in *Hodgson* v. *Minnesota* and *Ohio* v. *Akron Center for Reproductive Health*, which are excerpted in this issue of *Family Planning Perspectives* [p. 177], provide further signals of how far the new Supreme Court majority is willing to go beyond last year's *Webster* v. *Reproductive Health Services* in dismantling the 1973 *Roe* v. *Wade* decision.

Although the cases involved relatively narrow issues, the Court had once again been petitioned by the Bush administration to discard *Roe* v. *Wade* altogether. Nonetheless, in its latest decisions—as in *Webster*—the new Court majority (with the exception of Justice Antonin Scalia) seems to insist that there *is* a constitutional right to abortion; it simply seems unsure of or unclear about exactly what that right consists of. The majority justices, having expressed their disapproval of *Roe* v. *Wade*, do not appear to have been able to construct a coherent alternative legal framework to define the constitutional protections to be given to abortion.

Hodgson and *Ohio* addressed a pair of specific, and difficult, questions in the abortion controversy: the ability or capacity of a minor to give legally binding informed consent, and the rights and responsibilities of parents in regard to their minor children. Currently, under most (but not all) circumstances, the medical treatment of children must be authorized by a parent or guardian. However, under laws enacted in many states, minors may seek treatment on their own for conditions such as pregnancy, sexually transmitted diseases, substance abuse and psychological disturbances—problems that a young person might be reluctant to reveal to a parent and for which he or she might delay treatment (or not seek it at all) if parental involvement were mandated.

The Supreme Court had ruled in *Planned Parenthood of Central Missouri* v. *Danforth* and in *Bellotti* v. *Baird* that the constitutional protection given to abortion could not be conditioned by age or minority status and that parents could not veto their daughter's choice to have an abortion. If a girl did not want to tell a parent of her pregnancy or was unable to obtain parental consent for an abortion, she could go to a judge instead, on a purely confidential and expeditious basis. The judge's role was to ascertain her maturity and her understanding of the choices and consequences of the courses of action offered to her. The decision was hers, however, assuming she could meet these conditions. If she could not, the judge was to make the abortion decision for the girl, in light of the girl's own best interest.

The Court had never ruled, however, on whether the requirement of prior notification of a parent (rather than the parent's prior consent) would pass constitutional muster, whether a mandated waiting period could be imposed before the abortion is obtained or whether one parent (and if so, which) or both parents (and if so, whether biological or custodial) had to be notified. All of these issues, and others, were addressed in the two cases, and all were decided in ways damaging to the rights and welfare of young women.

The Court concluded in *Hodgson* that states may require that both biological parents be notified as long as states also provide a judicial bypass for minors who do not want to inform their parents about the pregnancy or decision to have an abortion. In doing so, this ruling delivered a sharp blow to the authority of single or custodial parents to make judgments affecting their children's health and welfare. The Court also abandoned its previous straightforward judicial bypass procedures and, in *Ohio*, approved instead the state's complicated legal proceedings, which were characterized by Justice Harry Blackmun (writing for the minority) as "an obstacle course," a "barricade" and a "tortuous maze." It also ruled that the proceedings did not have to be anonymous and thereby guaranteed to be kept secret, but merely confidential and thereby protected only from ordinary public intrusion.

It is the reasoning behind the decisions that prompts the characterizations of ambiguity and contradiction. Repeatedly, justices in the majority advanced a line of argument on one page that they promptly refuted on the next. Insisting that they were reaffirming earlier positions, they readily contradicted or eradicated them. For example, in *Ohio*, the Court chose to ignore the "pleading trap" (as described by the Court of Appeals) that requires a minor to face without counsel an unfamiliar and frightening court system and select one of three alternative courses of action. In accepting Ohio's "tortuous maze" of judicial bypass procedures, the majority blandly dismissed the difficulties involved. Having asserted that "the State has no legitimate interest in questioning the first parent's judgment or in presuming him or her incompetent to make decisions regarding the child's health and welfare" and that "the two-parent requirement interest actually disserves the state interest in protecting and assisting the minors with respect to the thousands of dysfunctional families affected by the statute, where the requirement proved positively harmful," the Court found such a requirement acceptable. Having acknowledged that "the State has no legitimate interest in conforming family life to a state-designed ideal by requiring family members to talk together," Justice Anthony Kennedy, writing for

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the majority, went on to say that even if parents are divorced and the noncustodial parent has never supported the minor or made any attempt to establish a relationship with her, the need to notify will "facilitate the parent-child bond on the assumption that parents will act in their child's best interest." Interestingly, the opinion offered no justification for the assumption that a noncustodial parent who has had no contact with his or her daughter would know where that child's best interest lies.

In a separate opinion, Justice Sandra Day O'Connor agreed that Minnesota's is "the most stringent notification statute in the country" and called it "all the more unreasonable when one considers that only half of the minors in the State of Minnesota reside with both biological parents." No matter: O'Connor concluded that it passes "constitutional muster because the interference with the internal operation of the family . . . does not exist where a minor can avoid notifying one or both parents by use of the bypass procedure." A law characterized as without "sufficient justification," "unreasonable" and the "most stringent" in this country is thus allowed to stay on the books as long as a way can be found to go around it.

Elsewhere, the Court's majority took pains to explain that a 48-hour waiting period between the notification and the abortion might delay the procedure somewhat and impose a burden on the minor's rights, but the Court considered such a burden only "minimal." At the same time, the majority dismissed the contention that Ohio's judicial bypass, which could take up to 22 days, represents a hindrance to a girl seeking an abortion. After all, said the Court, "the mere possibility that the procedure may require up to 22 days in a rare case is plainly insufficient to invalidate the statute on its face . . . ," dismissing the fact that such a delay would certainly place an "undue burden," which the Court elsewhere had ruled permissible only if it is kept "minimal."

Behind the "lawyerly dissection of the federal judicial precedents" (to use the words of Scalia) lies a deep and apparently unreasoned hostility. After reading these decisions, one cannot help but agree with Scalia that the Court should end "its disruptive intrusion into this field as soon as possible," although his proposed solution to the present muddle—to do away with the constitutional right to abortion altogether—is hardly the remedy.

One year ago, I asked in light of the *Webster* decision what the new boundaries of permissible state regulation of abortion would be (J. I. Rosoff, "The *Webster* Decision: A Giant Step Backwards," **21**:148, 1989). The answers, I suggested, might come this year, given that the Court had agreed to review three more cases. One of these was settled before Supreme Court review (an Illinois case involving clinic licensing requirements), but the decisions in the two remaining cases—and their painfully obvious ambiguities, contradictions and murkiness—bode poorly for the future constitutionality of reproductive rights. The impending changes in the configuration of the Court can only presage a further gradual, muted retreat from these rights or a sharper, clearer curtailment or abolition of the constitutional protection guaranteed in *Roe* v. *Wade* and so steadfastly supported by Justice William Brennan.

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Two-Thirds of Women Now Work During Their First Pregnancy; Half Return to Work Within One Year

Women's work patterns during pregnancy and after the birth of their first child have changed dramatically since the early 1960s because of increased female participation in the work force and improved maternity leave benefits, according to a report from the U.S. Census Bureau.[1] The proportion of women working during their first pregnancy increased from 44 percent in the early 1960s to 65 percent in the early 1980s. In addition, women have become more likely to return to work soon after giving birth: Only one-sixth of all women in the early 1960s, but half of all women in the 1980s, worked during their child's first year of life. Receipt of maternity benefits (in the form of payment or job security) is the strongest predictor of prompt return to work after the birth of the first child. The proportion of women receiving maternity leave rose from 16 percent in the early 1960s to 47 percent in the early 1980s.

The Census Bureau study is based on retrospective data gathered from personal interviews, conducted between January and April 1986, with about 9,000 women. The sample is made up of two groups, chosen in 1984 and 1985 as part of the Survey of Income and Program Participation; respondents were interviewed up to eight times over the course of two and one-half years, at intervals of four months. This study is based on responses to questions about maternity leave included in the eighth interview of the 1984 sample and in the fourth interview of the 1985 sample. Respondents were representative of the noninstitutionalized population of the United States aged 15 and older; first pregnancy is defined as the respondent's first pregnancy that resulted in a live birth.

Employment During Pregnancy

The proportion of women in the work force increased steadily during the last three decades, as did their age, education and work experience at the time of their first child's birth. Between 1960 and 1985, the proportion of U.S. women aged 16 and older who were employed rose from 36 percent to 50 percent, and the proportion of women having their first birth after age 25 doubled, from 20 to 41 percent. Sixty percent of first-time mothers aged 25–29 and 72 percent of those aged 30 and older in 1985 had completed at least one year of college, compared with 53 percent and 42 percent, respectively, in 1970. Seventy-five percent of first-time mothers in 1981–1985 had been in the work force at least six months before their first child's birth, up from 60 percent in 1961–1965.

Because of greater work experience and improved maternity leave arrangements, more women are staying at their jobs after becoming pregnant. Sixty-five percent of women who had their first births in 1981–1985 worked during pregnancy, compared with 44 percent in 1961–1965; the proportion of employed women continuing to work during their last trimester rose from 52 percent to 78 percent during the same period. Since 1961, between 80 percent and 90 percent of all women who were employed during their first pregnancy worked full-time.

Work status before pregnancy is the strongest predictor of employment during pregnancy. Among first-time mothers who had ever worked six or more consecutive months before their first birth, 83 percent in 1981–1985 worked while they were pregnant, up from 70 percent in 1961–1965. In contrast, few women begin working during pregnancy; they represented just six percent and eight percent of women having their first births in 1961–1965 and 1981–1985, respectively.

Women who work during their first pregnancy are more likely to be white, to be aged 25 or older and to have at least a high school education. Although work force participation has increased overall among pregnant women since the 1960s, there have been few, if any, such changes among teenagers, blacks, high school dropouts or women with a premarital first birth. In fact, the data show that among women with all of these characteristics, employment during pregnancy has decreased since the 1960s, possibly because of programs enabling pregnant teenagers to remain in school or because of improved social welfare benefits.

Trends in Maternity Benefits

In the early 1960s, 63 percent of working women quit their jobs before their first child's birth; this proportion dropped to 28 percent in the early 1980s. The change appears to be partly a result of improved maternity benefits: Only 16 percent of pregnant working women in the early 1960s received either paid leave or maternity leave with the assurance that their position would be held for them after their child's birth, but 47 percent in 1981–1985 received such benefits. The proportion of women receiving unpaid leave with an informal agreement about the ability to return to work showed little change—14 percent vs. 20 percent—from the early 1960s to the early 1980s.

In 1961–1965, about half of all women receiving maternity benefits received some monetary compensation. By 1976–1980, the proportion receiving cash benefits had increased to 72 percent and by 1981–1985, to 81 percent. However, from the 1960s through the early 1980s, only about half of those receiving cash payments were fully compensated for all of their leave time.

Women in the 1980s who received maternity benefits at the time of their first child's birth were more likely to be older, college educated and full-time employees and to work into their third trimester than were those who received no benefits. Those receiving unpaid leave were more likely to continue to work into their third trimester and to be employed part-time.

In the early 1960s, women who worked longer into their pregnancies were those in greater financial need: teenage women, part-time workers and high school dropouts. By the early 1980s, the socioeconomic profile of women working into the last trimester had changed: College-educated women, married women, and women aged 25 and older worked relatively longer into their pregnancies than did less-educated, unmarried and younger women.

Age was strongly linked with various leave arrangements obtained by women having their first births in 1981–1985. The proportion of women receiving maternity leave (usually paid) increased steadily with age, from 20 percent among those aged 18–19 years to 60 percent among those aged 30 or older. (The proportion of women obtaining informal unpaid leave did not vary substantially among age-groups.) Pregnant women aged 18–22 were twice as likely to quit their jobs as were those aged 25 and older (43 percent vs. 20 percent). In addition, 14 percent of 18–19-year-olds were let go from their jobs while pregnant, compared with just two percent of women aged 30 and older.

There are also some racial differences in maternity leave trends: While the proportion of white women quitting their jobs during pregnancy declined dramatically, from 66 percent in 1961–1965 to 29 percent in 1981–1985, the proportion among blacks only dropped from 39 percent to 26 percent during the same period. Since the 1960s, black women have been more likely than whites to receive maternity benefits, but among the more recent five-year birth cohorts, whites have made greater relative gains in securing such benefits. Among women having their first births in 1981–1985, there were no significant differences by race in quitting work, receiving maternity benefits or taking an unpaid leave of absence, but black women were twice as likely as white women to be let go from their jobs when pregnant (8.7 percent vs. 4.2 percent).

Employment After Childbirth

Even more dramatic than the increased work force participation of pregnant women since the 1960s is their increasingly rapid return to work after the birth of their first child. In the early 1960s, only 14 percent of new mothers returned to work within six months, and only 17 percent returned within 12 months. In contrast, among women who had their first birth in 1981–1984, 44 percent had returned to work six months after childbirth and 53 percent had done so by the 12th month. From 1961 through 1984, 50–60 percent of women who returned to work within a year after childbirth returned within three months, and 75–85 percent were working by the sixth month. About 75–85 percent of women returning to work less than three months after childbirth returned to a full-time position; however, among those returning 3–12 months after childbirth, women in 1981–1984 were less likely than women in 1961–1965 to work full-time (57 percent vs. 74 percent).

Women's socioeconomic level, receipt of maternity benefits and work experience during pregnancy all significantly influence the likelihood of returning to work soon after childbirth. Although older, white and well educated women are most likely to be employed while they are pregnant, among all those who work during pregnancy, teenagers, blacks and high school dropouts are most likely to return to work within six months after birth.

Among women who had their first birth in 1981–1984, 71 percent of those who received maternity benefits returned to work within six months after childbirth, compared with 43 percent of those without benefits. However, the investigators caution that the impact of maternity benefits on a woman's decision to return to work depends on the type of job and on the number of years a woman has committed to it.

In general, working during pregnancy is the strongest predictor of a rapid return to work after childbirth. In the early 1980s, 59 percent of women who worked during pregnancy returned to work within six months, compared with just 16 percent of those who did not work during pregnancy. (During the early 1960s, these proportions were 21 percent and eight percent, respectively.) Among women having their first child in 1981–1984, those who worked the longest into pregnancy returned the most rapidly after the birth: Seventy-one percent of those who left work less than one month before delivering returned within six months, compared with 36 percent among those who left their job three or more months before they gave birth.—*M. Witwer*

Reference

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High-Risk Sexual Behavior Remains Prevalent Among College Women, but Condom Use Rises

The sexual behavior of college women has changed little over the last 14 years, despite the rising prevalence of sexually transmitted diseases such as genital herpes, chlamydia and AIDS, according to a series of surveys conducted at a large private northeastern university.[1] The surveys, which were conducted during the 1974–1975 and 1985–1986 academic years and in spring 1989, found no significant differences over time in the proportion of women who were sexually experienced, in the sexually active women's average number of male partners or in the proportion of women engaging in high-risk sexual practices. However, the proportion of sexually experienced women who reported regular condom use rose from six percent in 1974–1975 to 25 percent in 1989.

Women who consulted gynecologists at the university health service were asked to fill out an anonymous questionnaire about their sexual development, sexual experience and gynecologic symptoms. Completed questionnaires were returned by 486 of 500 women in 1975 and by 161 of 165 women in 1986; all of the questionnaires of the 132 women approached in spring 1989 were returned, although some were not filled in completely. In 1989, another 189 college women who were not health-service clients were asked by fellow students to fill out the questionnaire, and all but two did so.

There were no statistically significant differences in mean age, educational level, marital status or mean age at menarche among the three samples of health-service clients. However, the proportion of nonwhite women was almost twice as large in 1989 as in 1975 or 1986 (21 percent vs. 11 percent or 12 percent) and the mothers of the 1986 and 1989 respondents were more likely to be college educated than the mothers of the 1975 respondents (42 percent and 43 percent vs. 27 percent). Eleven women in 1975 and two in 1989 reported that they had had gonorrhea; none of the respondents had had syphilis.

The level of sexual experience among the health-service clients appears to have changed little: The proportion who had ever had intercourse was 88 percent in 1975 and 87 percent in both 1986 and 1989. In

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comparison, 65 percent of the women who had not visited the health service were sexually experienced. Twenty-two percent of all health-service clients surveyed in 1975 had had six or more lifetime partners, compared with 20 percent in 1986 and 21 percent in 1989; that proportion was 23 percent among women who had not visited the health service. In each survey year, about one in five health-service clients—22 percent in 1975, 19 percent in 1986 and 21 percent in 1989—reported having had three or more partners during the preceding year. The likelihood that women had engaged in fellatio, cunnilingus or anal intercourse appears to have changed little over time. For example, 10 percent of all respondents in 1975, eight percent in 1986 and nine percent in 1989 had had anal intercourse. In addition, the proportion who had had a lesbian relationship did not differ among the three survey years.

Forty-seven percent of the sexually experienced women surveyed in 1989 who had visited the health service and 52 percent of those who had not made such a visit reported having had two or more male partners during the preceding year. The two groups also reported similar frequencies of sexual intercourse during the week before the survey. The proportions of women who had not visited the health center who reported that they engaged in fellatio (36 percent regularly and 49 percent occasionally), cunnilingus (24 percent regularly and 40 percent occasionally) and anal intercourse (11 percent occasionally) were similar to those proportions among their counterparts who had visited the health service. Nine percent of those who had visited the health service and seven percent of those who had not done so had had a sexual relationship with a woman.

The use of contraceptive methods varied widely by survey year. Among the sexually experienced health-service clients, the pill was the usual method of birth control for 55 percent in 1975, 34 percent in 1986 and 42 percent in 1989. The diaphragm was the usual method for 21 percent of those women in 1975, 42 percent in 1986 and 13 percent in 1989. The proportion of health-service clients using condoms rose sharply over the study period, from seven percent in 1975 to 14 percent in 1986 and 25 percent in 1989. Among the sexually active women who had not visited the university health service, 39 percent used condoms, 33 percent used the pill, seven percent relied on the diaphragm and 16 percent used "other" methods; four percent did not use any method. The proportion of health-service clients who did not use any method rose from one percent in 1975 to eight percent in 1986, and then fell to less than one percent in 1989.

In 1975, 12 percent of sexually active health-service clients reported that their partner always or almost always used a condom when they had intercourse, compared with 21 percent in 1986 and 41 percent in 1989. In the 1989 sample of sexually experienced women who had not consulted the health service, 51 percent said that their partner always or almost always used a condom.

The emergence of genital herpes, chlamydia and AIDS during the period encompassed by the study has stimulated public health efforts to prevent the spread of sexually transmitted diseases. Information campaigns have recommended limiting the number of one's sexual partners, being discriminating in one's choice of partners, avoiding high-risk behavior such as anal intercourse and using barrier methods of contraception. According to the investigators, however, "public health campaigns have not had a substantial influence" on the habits and behavior of the college women in their sample. In 1989, the majority of the women surveyed did not use condoms, although the proportion of those who did had more than tripled over the 14 years encompassed by the study. Moreover, neither the proportion of women with multiple sexual partners nor the proportion of women engaging in anal intercourse had decreased during that period. The investigators conclude that "despite the existence of major new infectious diseases, sexual practices of these college women did not change markedly . . . with respect to the number of sexual partners or specific sexual acts."—*F. Althaus*

Reference

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Americans' Views on Sex Roles, Family Are Less Rigid Now Than in 1960s

Contemporary adults and teenagers have more egalitarian attitudes towards sex roles and feel less bound by social imperatives to marry, stay married, have children and remain faithful to their spouses, compared with their counterparts 25 years ago. According to a study using survey data collected between 1962 and 1986, these changes in attitudes concerning sex roles and family issues progressed throughout the 1960s and early 1970s, but slackened in the late 1970s and early 1980s.[1] The investigator contends that this pattern parallels broader societal changes related to religious beliefs, political orientation and civil liberties.

Data were taken from three main surveys, each of which has gauged attitudes towards family issues over a period of years. The Study of American Families began with a sample drawn from Detroit's 1961 birth records. The first wave of interviews in 1962 was with women who had given birth the year before; the women were reinterviewed in 1977, and they and their children born in 1961 were interviewed again in 1980 and 1985. Monitoring the Future is an annual nationwide survey of high school seniors conducted since 1976 by the University of Michigan. The General Social Survey, conducted annually since 1972 by the National Opinion Research Center, studies Americans over 18 years of age.

The three surveys recorded a general inclination toward egalitarian attitudes over the years studied. For example, the Study of American Families asked if important family decisions should be made by the man of the house: Thirty-two percent of the women surveyed in 1962 disagreed, but the percentage jumped to 67 percent by 1977 and to 71 percent and 78 percent in 1980 and 1985, respectively. When the women's daughters were asked the same question in 1980, 66 percent disagreed, and by 1985, 85 percent disagreed; among the sons queried in 1980, 45 percent disagreed, and five years later that proportion had reached 65 percent. Between 1977 and 1985, the General Social Survey recorded increases in egalitarian responses for all questions and in all agegroups. Monitoring the Future recorded substantial trends toward egalitarian responses from 1976 to 1985, with the exception of the responses of male participants in the 1980s, which showed no consistent trend in this area.

These three surveys provide data on attitudes toward marriage from 1976 to 1986 only. Although changes shown in the Study of American Families were not particularly striking, all participants were less willing in 1985 than in 1980 to say that "there are few good or happy marriages these days." Monitoring the Future revealed that marriage is clearly important to high school seniors; the percentages of students saying that they prefer not to marry remained low during this 10-year period, with no sign of an increase. There was, though, a trend toward preferring later marriage: Fifty-four percent of female high school seniors in 1976–1977 said the best time for them to marry was four or more years after high school; this proportion grew to 60 percent in 1980–1981, and to 67 percent in 1985–1986.

Fifty-one percent of women in the Study of American Families disagreed in 1962 with the statement "when there are children in the family, parents should stay together even if they don't get along." This proportion rose to 80 percent by 1977, but went no higher than 82 percent in 1980 and 1985. However, the percentage of daughters who disagreed with this statement was 83 percent in 1980 and 90 percent in 1985, and the proportion of sons who disagreed was 65 percent in 1980 and 71 percent in 1985.

In 1962, 85 percent of the mothers in the Survey of American Families said that all married couples who can have children should; by 1980, this proportion had fallen to 43 percent. The percentage of daughters disagreeing with this statement rose from 58 percent to 64 percent between 1980 and 1985. Nonetheless, between 1976–1977 and 1985–1986, the proportion of high school seniors who said they were likely to want children rose from 59 percent to 65 percent among young women and from 57 percent to 60 percent among young men. In 1976–1977, 69 percent of young men and 66 percent of young women agreed that being a father is one of the most fulfilling experiences a man can have; these proportions both rose to 72 percent by 1985–1986.

To examine attitudes toward premarital sex, the investigator combined data from the General Social Survey with those from another NORC study conducted in 1965. In 1965, 69 percent of young women and 65 percent of young men said they believed that premarital sex was always or almost always wrong; by 1972, these proportions were 24 percent and 21 percent, respectively. The proportion believing premarital intercourse to be wrong continued to decrease through the mid-1970s, falling in 1975 to 22 percent among young women and 15 percent among young men. Views among people over 30 were similar, although the changes were not as dramatic. In 1986, the General Social Survey began asking about teenage premarital sex: Between 65 and 75 percent of participants over 30 said that it was always wrong if the couple was 14–16; however, when the age of the couple was unspecified, not only were these proportions lower (24 percent and 37 percent respectively), but between 31 percent and 44 percent of the same group said that premarital sex was not wrong at all. The difference between responses to these two scenarios was also substantial among respondents under 30.

A combination of the NORC data and General Social Survey data from 1973 through 1985 revealed that in 1965, 81 percent of men and 85 percent of women under 30 said that an extramarital affair was always wrong, but by 1973 these proportions had fallen to 44 percent and 64 percent, respectively. There was a similar drop of more than 10 percentage points during this same time period in the proportion of participants over 30 who agreed that an extramarital affair was always wrong. This change in attitude did not continue, though: Whereas 63 percent of young men and 80 percent of young women queried in 1973 said that extramarital sex was always or almost always wrong, the proportions in 1985 were 84 percent and 88 percent, respectively.

With regard to cohabitation without marriage, all of those surveyed in the Study of American Families expressed greater approval between 1980 and 1985. Data from Monitoring the Future show more of a fluctuation: For example, in 1976–1977, 33 percent of females and 50 percent of males said that living together before marriage is a good idea; in 1980–1981, the proportion of women who said they approved of cohabitation stayed the same, but the proportion of men saying so declined to 42 percent.

The investigator notes that the apparent relaxation of societal rules concerning family issues in the 1960s and 1970s occurred concurrently with trends towards more tolerance, individuality and autonomy regarding religion, politics and civil liberties, and suggests that these issues may be linked. That these trends reached a plateau in the 1970s and did not continue strongly into the 1980s provides further evidence that they are related. The researcher also points out that greater acceptance of such circumstances as remaining childless, remaining single and getting divorced does not constitute endorsement. Consequently, because the imperatives to wed and have children are not as strong, the proportion of people who actually do so may decline with no corresponding decrease in those who want to do so.—*R. Turner*

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First-Birth Rates Among Women over 30 Are More Than Twice 1970 Levels

Nearly one in seven first births in the United States in 1986 occurred among women aged 30 or older, a proportion that has increased nearly fourfold since 1970.[1] According to a report issued by the National Center for Health Statistics (NCHS), the first-birth rate among women aged 30–34 increased by 140 percent over the period 1970–1986, while the first-birth rate among women aged 35–39 increased by 124 percent. These trends are primarily the result of increased marital dissolution rates and widespread postponement of marriage among young people; of the substantial increase in the numbers of women aged 25–39; and of the increased levels of educational attainment and labor force participation among women.

The vital registration data in the NCHS report for 1970–1971 are based on 50 percent samples of birth certificates from all states. Between 1972 and 1984, the 50 percent samples were progressively replaced by tallies of all births occurring in a state, so that by 1985 and 1986, data for all 50 states and the District of Columbia represented 100 percent of births.

The data indicate that by 1986, 15 percent of all first births in the United States were to women aged 30 and older. From 1970 through 1986, the first-birth rate among 30–34-year-olds increased by 140 percent, from 7.3 births per 1,000 women in 1970 to 17.5 per 1,000 in 1986. The corresponding increase among 35–39-year-olds was 124 percent, from 2.1 per 1,000 in 1970 to 4.7 per 1,000 in 1986. The rate among women in their early 40s remained relatively unchanged between 1970 and 1980, but increased from 0.3 per 1,000 to 0.6 per 1,000 over the period 1980–1986.

Broken down by race, rates of first births in 1986 were highest among women of "other races," excluding blacks—30.4 per 1,000 among 30–34-year-olds and 9.5 per 1,000 among 35–39-year-olds. First-birth rates among white women were 18.0 per 1,000 in the 30–34-year age-group and 4.9 per 1,000 in the 35–39-year age-group. Black women had the lowest rates of first births in these age-groups (11.2 per 1,000 among those aged 30–34 and 3.5 per 1,000 among those aged 35–39).

Although blacks still make up roughly

80 percent of those in the "other races" category, their proportion has decreased somewhat, while that of the Asian population has risen dramatically. Patterns of childbearing among older nonwhite women are anything but homogeneous: In 1986, only 19 percent of all births to blacks and American Indians were to mothers aged 30 and older; the comparable proportion among Asian women was 41 percent. In general, blacks and American Indians begin childbearing at young ages, while Asian women are nearly three times more likely to delay having their first child.

Among unmarried women, the racial differential in rates of childbearing is reduced when the analysis is restricted to first births. First births to unmarried 30–34-year-olds have recently increased among both black and white women, with steeper increases among white women. Overall, the rates of first births to older unmarried women have increased more rapidly than rates for all births to unmarried women: The first-birth rate among unmarried 30–34-year-old women increased by 47 percent from 1980–1986, while the overall nonmarital birthrate for this age-group increased by 27 percent.

The trends in first-time childbearing have been influenced by changes in a variety of measures, including the number of women in each age-group, rates of first births in each age-group, first-birth probabilities (first-birth rates computed for childless women) and the proportions of women who are childless. For example, the number of women aged 30–34 in the United States increased by 78 percent between 1970 and 1986; the number of women aged 25–29 and 35–39 also increased substantially (by 60 and 66 percent, respectively). In comparison, the number of women in their early 20s increased by only 20 percent, while the number of adolescents actually declined by three percent (a result of the end of the postwar baby boom).

In addition, large numbers of women are now reaching age 30 without having had any children. By the end of 1986, 30 percent of all women aged 30 in the United States were childless. The proportion among white women was slightly higher—33 percent of white women aged 30 were childless in 1986, compared with just 14 percent in 1970. Similarly, the proportion childless among 35-year-old white women rose from nine percent in 1970 to 22 percent by the end of 1986. Among white women aged 25, the proportion who had not yet had children reached a record high of 55 percent in 1986, up from 35 percent in 1970.

The tendency to postpone childbearing is apparent in the related decline in the first-birth rate among younger women. The rate for 15–19-year-olds fell by 27 percent over the period, from 53.7 per 1,000 in 1970 to 39.1 per 1,000 in 1986, and the rate for 20–24-year-olds declined significantly as well, from 78.2 per 1,000 in 1970 to 52.7 per 1,000 in 1986. The first-birth rate for 25–29-year-old women, on the other hand, changed comparatively little since 1980.

The trend toward delayed motherhood parallels the trend in increasing education among American women, although the level of educational attainment among these older mothers is far greater than that of the general population. The decline in first-birth rates among women 25–29 who completed college reflects the fact that well-educated women are postponing marriage and childbearing more and more. Among college-educated women, first-birth rates among 30–34-year-olds increased by 77 percent from 1975 through 1986, while among 35–39-year-old women who completed college, rates of first-time childbearing rose by 96 percent. Moreover, the women who are giving birth for the first time in their 30s are increasingly better educated: Since 1980, nearly one-half of women giving birth for the first time were college graduates, while the comparable proportion in 1970 was roughly one-fourth.

The higher educational attainment among older first-time mothers is associated with early prenatal care and better pregnancy outcomes. In 1986, 94 percent of college-educated older white mothers and 86 percent of similar black mothers had received first-trimester care. Overall, fewer than five percent of the babies born to college-educated mothers in their 30s who had early prenatal care were of low birth weight.

In a related summary report,[2] the author concludes that the increases in first-time childbearing among older women since 1970 could have been anticipated based on several important demographic trends. These include the growing postponement of marriage and rising marital dissolution rates among young people; the decline (and leveling off) of first-birth rates among women in their 20s; the growth in the sheer numbers of women aged 25–39; and the fact that about 50 percent of currently childless women in their early 30s expect to have children. The author also observes that those who have made up for delayed childbearing by having their first child in their 30s have primarily been well-educated women. The data have implications for health care providers, since the likelihood of cesarean section is higher among older women, who are also at greater risk for certain pregnancy complications and congenital anomalies. In addition, the high rates of labor-force participation among these women—two-thirds of first-time mothers aged 30–44 were in the labor force as of June 1986—could have implications for increased child care needs in the future.—*L. Remez*

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Birth Weight, Birth Order Influence Twins' Higher Perinatal Mortality Rates

The perinatal mortality rate among twins is approximately five times that among single infants, according to two large studies of twin and singleton births in the United States. Twins' higher mortality rate appears to result from both their greater frequency of low birth weight and their poorer survival at higher weights. One study of twin pregnancies shows that at birth weights of 2,500 g or less, twins are at lower risk for fetal or perinatal mortality than are singleton infants, but at weights above 2,500 g, twins are at greater risk.[1] Another study of twin gestations concludes that the lowest perinatal mortality rate occurs among twins weighing 3,001–3,500 g at birth, and that the corresponding optimal birth-weight range for singleton infants is 3,501–4,000 g.[2] A third study suggests that there are no significant differences in mean length of gestation, birth weight and perinatal mortality between twins born to teenagers and those born to older women.[3]

The first study measured factors such as fetal death rate, birth weight, perinatal morbidity and mortality, maternal weight gain and complications during pregnancy or delivery among 1,253 twin deliveries at 13 Illinois hospitals during 1982–1987. These outcomes were compared with those of 5,119 singleton pregnancies during the same period. All infants weighed more than 500 g at birth. The racial composition of the two groups of mothers in the sample was similar, although mothers of twins were slightly more likely to be white (56 vs. 52 percent) or black (25 vs. 23 percent) and less likely to be Hispanic (15 vs. 20 percent) or Asian (four vs. five percent).

Women who delivered twins were slightly older and of higher parity, gained more weight during pregnancy, weighed more at delivery and delivered at an earlier gestational age than women with singleton births. In addition, mothers of twins were 2.5 times more likely to have hypertension or anemia during pregnancy and were three times more likely to have premature detachment of the placenta. There was no increased risk of pyelonephritis, placenta previa or diabetes, either gestational or insulin-dependent. Twins were smaller at birth than singleton infants, had lower Apgar scores and were more likely to have congenital anomalies.

Birth order and birth weight modify twins' increased rates of fetal, neonatal and perinatal death. For example, first-born twins are generally at lower risk than their siblings. Among all infants studied, the rates of fetal death for first-born twins, second-born twins and singleton infants were 16, 26 and six per 1,000 births, respectively, while the rates for neonatal death were 33, 40 and five per 1,000, respectively. Perinatal death rates for first-born twins, second-born twins and singleton infants were 49, 64 and 10 per 1,000, respectively.

Among low-birth-weight infants (those weighing 2,500 g or less at birth), twins were more likely than singletons to survive: In this weight category, twins' rates of fetal, neonatal and perinatal death were approximately double the normal rates, while singletons' mortality rates were increased 10-fold. In contrast, among infants weighing more than 2,500 g, twins were less likely than singletons to survive: The perinatal death rate for first-born twins was 12.6 deaths per 1,000 births, compared with a rate of about two per 1,000 births among singleton infants.

Within sets of twins weighing 2,500 g or less, the risk of perinatal mortality was higher for the second-born twin; among twins weighing more than 2,500 g, the first-born twin was at higher risk. When the birth weights of twins differed by less than 10 percent, their perinatal mortality rates were similar. The risk of perinatal death increased for the second-born twin as birth weight differences increased, with an odds ratio of 1.7 among those whose weight differed by more than 25 percent from that of their first-born sibling.

The second study analyzed prepregnancy weight, prenatal weight gain and pregnancy outcome for 922 twin gestations. Researchers used Kansas' linked birth-death certificate information for 1980–1986, collecting data on all pregnancies of 38–42 weeks' duration, which included 201,784 singletons and 1,984 twins. (Complete information was available for 1,844 of the twins.) Compared with singleton infants, twins were approximately half as likely to be born at term, nearly 12 times more likely to be of low birth weight, and 4.7 times more likely to die during the perinatal period. Perinatal mortality rates were lowest among twins weighing 3,001–3,500 g and among singleton infants weighing 3,501–4,000 g. Approximately 90 percent of the mothers in the sample were white.

The researchers found that among women who began pregnancy either underweight or at normal weight, there was a linear increase in twins' birth weights as maternal weight gain increased. Underweight women who delivered at least one twin of optimal birth weight (3,001–3,500 g) gained an average of 44 pounds during pregnancy, while women of normal weight who delivered such a twin gained an average of 41 pounds. Obese women and very obese women (both groups of which had higher rates of twin gestations per 1,000 pregnancies) gained an average of 37 and 29 pounds, respectively, when carrying at least one twin of optimal birth weight. When compared by prepregnancy weight groups, women carrying twins gained an average of 6.3 pounds more than women carrying singleton infants.

A third study found that twins born to adolescents appear to be just as healthy as those born to older mothers. Using data for 1981–1986 at Grady Memorial Hospital in Atlanta, researchers compared outcomes of 50 twin pregnancies among adolescents younger than 17 with 395 twin pregnancies among women aged 20–34. (Forty of the adolescent mothers and 327 of the older mothers were black.) There were no significant differences between the two groups in mean length of gestation (36 weeks), birth weight of the first-born twin (2,069 g among adolescents vs. 2,166 g among adults) or perinatal mortality (10 percent vs. seven percent for adolescents and older mothers, respectively). Maternal age was not a predictor of birth weight, whereas length of gestation was. Because the study was based on a relatively small number of adolescents, the researchers caution that the results cannot be generalized to the U.S. population. They conclude that "it is possible that the adverse impact of twin gestation outweighs any deleterious effect that may be associated with young maternal age, resulting in the absence of significant differences in pregnancy outcome between adolescents and older gravidas."—*M. Witwer*

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Cohabitation Has Become Common in Great Britain, Especially for Divorced

One in seven unmarried women and one in eight unmarried men in Great Britain under 60 were cohabiting in 1986 and 1987, according to data from that country's General Household Survey (GHS); the proportions were greater—one in three men and one in four women—among the divorced.[1] Furthermore, over half the couples who married in 1987 had lived together beforehand. Cohabitation rates were highest among people in their late 20s and early 30s, and among residents of the South East region of England (containing Greater London) and East Anglia. More highly educated single women, less educated divorced men, and men and women of higher socioeconomic status tended to be more likely to cohabit. Four percent of all dependent children in Great Britain were living in a family headed by a cohabiting couple. Overall, cohabitation rates in Great Britain appear to be higher than those in the United States.[2]

The GHS has collected data on cohabitation from women since 1979 and from men since 1986. An analysis of data from 1986 and 1987 revealed that 10 percent of never-married men and 13 percent of never-married women were cohabiting; for the separated and divorced, those proportions were 30 percent among men and 20 percent among women. Among all men and women in Great Britain under age 60, the proportions cohabiting were 12 percent and 14 percent, respectively. According to data from the 1987–1988 U.S. National Survey of Families and Households, four percent of Americans aged 19 and over were cohabiting in 1987, including 11 percent of the never-married and 10 percent of the previously married.[3]

In Britain, 58 percent of men and 53 percent of women who married in 1987 had lived with their spouse before marriage. Of U.S. marriages beginning in 1980–1984, 44 percent were preceded by cohabitation, and it is likely that this proportion has now reached well over half.

Thirty-eight percent of divorced men in Great Britain aged 18–49 were cohabiting at the time of the survey, compared with 13 percent of never-married men. Seventeen percent of never-married women and 27 percent of divorced women were cohabiting in 1986–1987; at the time of the 1979 GHS, these proportions were eight percent and 20 percent.

Cohabitation in Great Britain is most prevalent among unmarried men and women in their late 20s and early 30s; proportions were distinctly higher for men than for women only after age 45. For example, 25 percent of unmarried men and women aged 25–29 were cohabiting in 1986–1987, but those proportions were 16 percent and six percent, respectively, among their counterparts aged 50–54. Among the never-married, up to age 30, a slightly greater proportion of women than of men were cohabiting, but after age 40, proportions were higher for men than women. Among divorced persons, however, relatively more men than women were cohabiting in each age-group: For ages 25–29, for example, 27 percent of divorced women and 46 percent of divorced men were cohabiting, while 26 percent of never-married women and 23 percent of never-married men were cohabiting. In the United States, by comparison, 16 percent of never-married persons and 28 percent of previously married persons aged 25–29 were cohabiting; cohabitation was most prevalent among never-married persons aged 25–34 (16–17 percent) and divorced persons younger than 30 (26–28 percent).

At the time of the survey, over half of cohabiting never-married men and women in Great Britain had been in such a union for less than two years; the median durations were 22 month and 20 months, respectively. Around half of cohabiting divorced men and women had been doing so for about three years (median durations of 35 and 37 months, respectively). Since 1979, the median duration of cohabitation among never-married women aged 18–49 lengthened from 18 to 19 months, but for divorced women it rose from 28 to 34 months. In 1986–1987, 38 percent of husbands and 36 percent of wives marrying for the first time who had cohabited before marriage reported that they had done so for less than one year; 30 and 31 percent, respectively, had cohabited for 1–2 years. Among those remarrying after a divorce the durations were longer: Twenty-seven percent of remarrying husbands and 28 percent of remarrying wives had cohabited beforehand for less than one year, while 24 percent and 23 percent, respectively, had cohabited for 1–2 years. For couples who had married since 1980, the median length of premarital cohabitation was 15 months, 13 if either the husband or wife was marrying for the first time. Life-table estimates from U.S. data showed that 59 percent of cohabiting couples either marry or stop living together after a year, with one-third of cohabiting unions lasting two years, and the median duration of all cohabiting unions being 1.3 years.

There are clear regional patterns of cohabitation in Britain, with the highest rates occurring in East Anglia (17 percent) and the South East region, which contains Greater London (16 percent). The lowest rates are found in Scotland (nine percent) and Wales (eight percent). Regional patterns differed widely for divorced and separated men and women, but the regional distribution of cohabiting never-married men and women was similar.

There were few educational differences in the proportions of cohabiting single men aged 20–39. Among single women, those with "A" level qualifications (the highest level of education attainable before attending a university) were only half as likely to cohabit than their counterparts with university degrees. There were few differences educationally in the proportions of divorced and separated women who were cohabiting, but divorced and separated men with "O" levels only—usually obtained at age 16, and needed before going on to "A" levels— tended to cohabit more than men with higher qualifications, including a university degree. U.S. data show that while the highest rates of cohabitation are found among those with the least education (with unmarried college graduates 64 percent less likely to cohabit than those who did not finish high school), more than one-quarter of U.S. college graduates have cohabited before marriage.

Nine percent of never-married men in junior nonmanual jobs were cohabiting in 1986–1987, compared with 20 percent who were employers or managers. Among divorced and separated men, these proportions were 37 percent and 47 percent, respectively. Among never-married women who were in junior nonmanual jobs, 18 percent were cohabiting in 1986–1987, compared with 28 percent who were employers or managers. For divorced and separated women, those proportions were 21 percent and 32 percent, respectively.

In each age-group, cohabiting never-married women were less likely than married women to have a child, but more likely to have a child than were their noncohabiting counterparts. Twenty-eight percent of cohabiting never-married women in Great Britain under age 60 had had a child, compared with only eight percent of their noncohabiting counterparts. For women in their 20s—the prime age for cohabiting—these differences were least marked (29 percent and 19 percent, respectively). Divorced and separated women who were cohabiting, however, were less likely to have had a child than those who were not cohabiting, particularly among women in their 30s. There were an estimated 440,000 dependent children in families headed by a cohabiting couple—about four percent of all dependent children in Great Britain.

It is also estimated that about 1.8 million people under age 60 were cohabiting in Great Britain at the midpoint of the 1986–1987 period. About 1.2 million had never married; about 900,000 were single and under 30 years of age. The investigators estimate that cohabitation among never-married, separated and divorced women under 50 increased by 170 percent between 1979 and 1987. Cohabitation has also risen sharply in the United States; for example, the proportions of persons cohabiting before marriage rose from 11 percent for marriages begun in 1965–1974 to 44 percent for marriages begun in 1980–1984. Rates of cohabitation in Great Britain appear to be higher than those in America, but rates in both countries are growing. The researchers who carried out the British study note that as cohabitation becomes more prevalent and carries less stigma, information on the subject may become both more accessible and more worthy of study.—*R. Turner*

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Books in Review

A New Approach to the Abortion Debate

Mother-Love and Abortion: A Legal Interpretation
by Robert D. Goldstein, University of California Press, Berkeley, Calif., 1988, $19.95, 240 pp.

Reviewed by Nadine Taub

Robert Goldstein's *Mother-Love and Abortion* is above all an attempt to bolster *Roe* v. *Wade*'s protection of legal abortion with a highly original theory, "mother-love," which recognizes the pregnant woman's unique ability to make the abortion decision on behalf of the mother-fetus dyad. But this book is also a clear and sophisticated guide to the philosophical and legal debates on abortion, and an excellent interdisciplinary source of references to the literature on this topic. Whether or not one accepts Goldstein's theory, *Mother-Love and Abortion* is an important resource.

Goldstein begins by analyzing the question of "individual rights and the logic of separateness" [p. 5] as it pertains to abortion. He reviews the work of Judith Thomson and other philosophers who assume that the interests of a woman and a fetus are incompatible and that a woman has a right to choose abortion—at least in some circumstances—whether or not the fetus is regarded as a person. Here Goldstein makes the significant point that those who would ban abortion except in the case of rape or related circumstances must have a theory not only about when life begins but about the nature of sexuality. If a woman who engages in sexual intercourse must see a resulting pregnancy through, the argument must go beyond the question of the fetus' status as a person to explain why this obliges her to sacrifice her life, health or bodily integrity for someone else.

Goldstein then considers the ways in which legal analyses reflect the philosophical debates he describes, once again emphasizing individual rights. He presents the *Roe* v. *Wade* decision in two parts. First, he discusses the part of the decision, considered relatively uncontroversial, that says a fetus is not a person within the meaning of the Fourteenth Amendment and that recognizes a woman's interest in privacy, which can be outweighed only by a government interest in actual or potential new life. Goldstein then turns to the decision's more controversial aspect, the Court's attempt to determine how far the Constitution goes beyond the consensus that a state cannot prohibit abortion when a woman's life is at stake. The Court has made it clear that the state cannot require a woman to sacrifice her health, but Goldstein suggests that it is not clear whether a woman's interest in health includes her interest in avoiding the increased statistical risk of childbirth compared with that of abortion.

In examining the growing criticism of *Roe* within the Court, the book points to Justice Sandra Day O'Connor's concern that technology is now rendering *Roe*'s trimester analysis obsolete and providing the state with an interest in a fetus that is viable earlier and earlier in pregnancy. Goldstein states that this concern—voiced by O'Connor in her dissent in the 1983 *Akron* v. *Akron Center for Reproductive Health* decision—might be somewhat hasty, as 20–24 weeks appears to be the inside limit for fetal viability in the near future. Nevertheless, the prospect of a significant drop in the age of fetal viability—or of embryo transfers and artificial wombs that would permit the removal of the embryo or fetus from the woman (thereby restoring her bodily integrity)—indicates the need to strengthen the woman's claim to the abortion choice.

Goldstein therefore seeks to revise the logic-of-separateness argument, which poses fetal interests against a woman's autonomy, by developing a notion of a unique mother-fetus dyad in whose interest the woman speaks. To support this approach, he looks to recent work in political philosophy, feminist theory and developmental psychology that emphasizes communal relationships rather than individual rights, and urges us to focus not on whether the fetus is a separate person, but on "the relationship in which the offspring develops into a person" [p. 38]. He comments:

> That relationship is of a different order from those whose participants social convention and ordinary language treat as distinct selves. Instead, common wisdom understands that mother and offspring belong together, as, for example, the mother-infant motif in a myriad of paintings attests. Constituting a whole, they may not be readily understood apart from each other. For their relationship, central to an understanding of potential life, is constitutive of the offspring's eventual self [p. 38].

Goldstein goes on to argue that a woman possesses "the right to determine whether she will enter into a physical and emotional symbiosis with the fetus-infant and, more generally, into a love relationship of parenting" [p. 54]. He holds that the general identity of parenthood and the specific love required of a mother, though akin to the expressive and self-defining aspects of other intimate associations, are much closer to the soul and are not the proper subject of state coercion. Goldstein argues that because this dyad, or symbiotic unit, exists both during pregnancy and for at least the first several months after birth and because the woman is the only part of this single entity with any reality-testing and decisional capacity, she must be rec-

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ognized as the exclusive decision-maker [p. 53].

Goldstein's understanding that a woman's claim to bodily integrity is not sufficient to justify the right to an abortion is important; there is a pressing need to articulate the woman's interests more fully. Embryo transfers and artificial wombs are not just possibilities, and a woman faced with the option of embryo transfer may well "choose" to continue her pregnancy to term even though the transfer procedure would protect her bodily integrity. Moreover, as we know from Medicaid cases, the right of privacy has not proved strong enough, at least on a federal level, to assure low-income women access to abortion.

Nonetheless, Goldstein's approach may prove both inadequate and dangerous. First, the depiction of the unity of the maternal-fetal dyad may fail to convince those who see a conflict between the woman's and the fetus' interests. Indeed, the use of the term "mother-love" seems counter-intuitive, since the parent-child relationship which Goldstein describes is one that regularly triggers judicial action to protect the less powerful child. Given such doubts, once a dyad is acknowledged, critics may be unwilling to allow the woman to be the sole decision-maker.

This approach is also less than convincing when Goldstein proposes a reasonable period for abortion roughly equivalent to the six-month period protected by the Supreme Court in the *Thornburgh* v. *American College of Obstetricians & Gynecologists* decision and the *Akron* decision mentioned above. The author views the dyad as continuing into early infancy. Why then doesn't the woman's period of choice also extend into infancy? Goldstein's response—that after a six-month period of choice, it is the law's function to contain the ambivalence women will naturally feel towards their offspring—may strike some as inadequate.

Goldstein's reliance on the "reasonable period of choice" is troubling in other respects as well. He finds the existing period of choice reasonable for basically the same reasons that the Court did in recent decisions protecting choice for a limited period:

> The period of four to six months marks a time in pregnancy when differences between the fetus and the neonate begin to diminish substantially—associated as it is with quickening and the greater involvement that it brings, sentience, and the later development of higher brain capacity and mature organ systems. Besides the woman's knowledge of internal fetal development is the increasing social visibility of her pregnancy after the first trimester, which this same fetal growth usually produces. Both the inner and outer dimensions intensify for many women the growing reality of impending birth and their need to prepare for the symbiotic activity it entails [p. 72].

It would appear, then, that there is something more than the closeness of the mother-fetus dyad that makes it difficult for a woman to opt for abortion later in pregnancy. If so, it is hard to see what Goldstein's approach contributes, and if not, it is hard to understand where the lines should be drawn.

Goldstein's dyadic approach may also be problematic for women in other reproductive contexts. Certainly the emphasis on the unique quality of the mother-fetus relationship is likely to make it harder for women to choose to forego motherhood altogether and to intensify the pain felt by infertile women. It could also inhibit the development of a fuller spectrum of relationships between children and adults, including stepparents, aunts and uncles, godparents, divorced stepparents and honorary kin of all sorts, a spectrum which seems critical to expanding women's options in public and private life.

Still, whether or not one is convinced by his approach, Goldstein has made a valuable contribution in underscoring the need to appreciate yet move beyond the woman's interest in bodily integrity as the justification for abortion. The deep and enduring consequences of parenthood have particular significance for women—the radical alteration of daily life; the continuing responsibilities; the financial obligations; the likely limitation of options; and the impact of kinship. Feminists fighting for the right to abortion, therefore, have often argued that laws criminalizing abortion interfere with their Fourteenth Amendment right to liberty, and Goldstein himself points out that the *Roe* v. *Wade* opinion reflected these issues to some extent. Feminists have also stressed the connection between women's ability to participate more fully in society and their reproductive freedom when making arguments for equal protection under the law, and, more recently, when defending a woman's right to choose a late abortion.

One advantage of arguments that look beyond the physical consequences of pregnancy is that they clarify the importance of reproductive autonomy to both sexes, and point to the special burdens borne by women. They also expose the social and cultural pressures to which women are subjected and lead us to consider whether a more egalitarian society, one that does not assign the responsibilities of raising children on the basis of gender, might make for a different configuration of reproductive rights.

The questions raised by *Roe* v. *Wade* and the abortion issue in general are extraordinarily challenging. Goldstein has succeeded admirably in summarizing a complex, interdisciplinary debate and presenting his own controversial perspectives. His law review style proceeds gracefully through difficult material and his endnotes are a mine of information. Those interested in the philosophical, legal and psychological problems raised by coerced pregnancy will find *Mother-Love and Abortion* extremely helpful.

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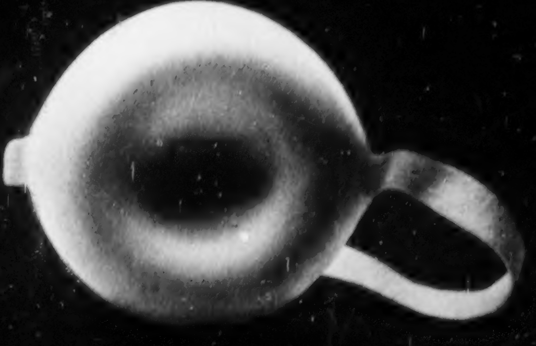

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REFERENCES: 1. McClure DA, Edelman DA: Worldwide method effectiveness of the Today® vaginal contraceptive sponge. *Adv Contracept* 1:305-311, 1985. 2. North BB, Vorhauer BW: Use of the Today® contraceptive sponge in the United States. *Int J Fertil* 30:81-84, 1985.

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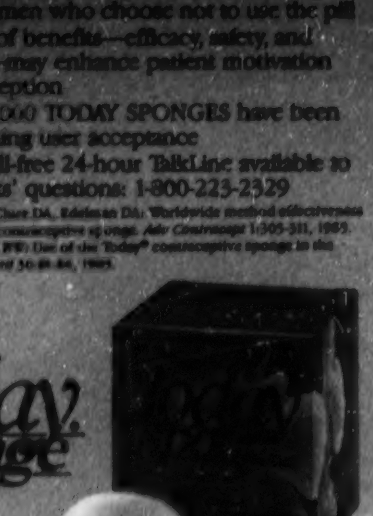

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